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OCCASIONAL PAPERS

OF THE

BERNICE PAUAHI BISHOP MUSEUM OF POLYNESIAN ETHNOLOGY AND NATURAL HISTORY.

VOL. I.—NO. 3.

Director's Report for 1900.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1901.

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To the Trustees of the Bernice Pauahi Bishop Museum.

Sirs:—In accordance with the vote of the Trustees at the stated meeting of January 13, 1900, I submit my Report on the condition of the Museum and the work in its various departments during the year 1900.

WILLIAM T. BRIGHAM
Director of the Museum.

Honolulu: March 8, 1901.

REPORT.

THE hope expressed in the previous Report that this Museum might soon make independent collections on the islands of the Pacific has been agreeably fulfilled during the past year by the expedition of Mr. Alvin Seale to Guam of the Marianas. By the courtesy of the United States War Department passage was allowed on a transport and for several months Mr. Seale industriously collected in various departments. The result will be seen farther on in this Report. With this exception the additions to the collections in the Museum have not been large, as until the Hawaiian Hall is ready for occupancy there is no room available for storage.

The room formerly devoted to the principal Hawaiian collection has been entirely remodeled. The cases removed and the floor replaced by concrete and mosaic tiling have left the hall ready for new cases, which are sadly needed, and have provided an effectual safeguard against the inroads of the termites. The fine Hawaiian Hall which has been long in construction is now completed and seems admirably adapted to its purpose, but as no cases have yet been provided it stands empty and unused. In the meantime the Hawaiian collections have for the most part been stored, some are on exhibition in the Hawaiian Vestibule in temporary cases, but all are suffering for want of proper cases. In a tropical climate a tight and insect-proof case is one of the most important desiderata of a Museum, and it is useless to accumulate specimens without first providing proper cases for their preservation if not for their exhibition.

While no especial attempt, except in the Guam expedition, has been made to increase the collections, much work has been done in revising the catalogues, especially the card catalogue which is locally arranged and of which each card contains as much information about the specimen that it represents as is available. In addition many of the cards bear a photograph or in some cases a drawing of the specimen, so that in consulting this catalogue one can see at a glance the nature of the specimen. As almost everything of importance has been photographed this plan has been easily carried out, and in any case it is very easy to make a group photograph of which the print can be cut to furnish the small pictures needed for the cards. By using the platinotype or bromide processes the print is as durable as the card. In some cases, as for example with poi pounders of which there are dozens much alike, the photograph shows a differentiation that no concise description could. Wherever the Museum publications furnish illustrations of objects in the collections these can be imprinted on the card as well. The card catalogue is thus in a way to become a fully illustrated record of the contents of the Museum. A new system of recording accessions has also been adopted, which it is thought will simplify the work. Hitherto the shells and plants have had a separate series of numbers in order to keep the label numbers as small as possible, the species of shells alone approaching 10,000, and now the birds and fishes have also been separated and the one in charge of each of these departments has an independent accession book for which he is responsible. Mr. Stokes has done much work on the manuscript of the catalogue of the collection of shells, which it is hoped may soon be ready for printing.

Mr. Walcott and myself made a hurried visit to Kauai, at the request of the Trustees to examine some private collections of Hawaiian antiquities, which had been offered to the Museum, but while the specimens were often desirable, there were very many duplicates and the prices asked were too high for duplicates. We found in the valley of Hanalei where sugar was largely cultivated, rice had taken its place, but elsewhere the canefields seemed to have taken all available land on that part of Kauai, even the grand grove of kukui trees near Kilauea, a grove of such antiquity that tradition does not recognize the youth of the picturesque old trees, is in danger of destruction that a few acres may be added to the canefields.

Having occasion during my vacation to visit the cities of the Atlantic seaboard I thought it desirable that Mr. Stokes should at the same time visit the American museums, and the Trustees acceded to my wishes and granted him a leave of absence and an appropriation for his expenses. His impressions of these museums I have requested him to add to this Report. I felt that his eye might notice improvements and desirable methods that might escape my examination, and we are so remote from all such institutions that it is very needful to study their work, methods and exhibits as thoroughly and as often as possible.

Soon after the publication of the first Memoir the Trustees decided that the edition of three hundred copies was not sufficient to meet the demand and ordered the issue of an additional number. This reprint has been commenced but has been delayed by the nonarrival of the colored plates made in Vienna. The printing office has been otherwise fully occupied in the preparation of the second Memoir which was issued at the close of the year. This was an Index of the Islands of the Pacific Ocean prepared by the Director, and the printing required great care and taste happily met by Mr. Greene. This and the Annual Report for 1899, which was issued about the same time, fully taxed the resources of the office. The next publication in quarto form will be Mr. Bryan's Key to the Hawaiian Birds, and this is well advanced. Much work has also been done in photographing the illustrations for the fourth Memoir which will be ready for printing during the current year. This will be a description of ancient Hawaiian Stone Implements.

By the kindness of Eric Knudsen Esq. the frame of an ancient grass house was obtained from a remote valley on the northwest coast of Kauai and Mr. W. E. H. Deverill attended to the difficult transportation of the heavy stonecut logs composing this frame. In due time this will be reerected in the new hall and properly thatched, thus preserving a genuine old Hawaiian house—*Hale pili*.

A number of books and specimens purchased in Europe during the year have not yet arrived owing to their detention in San Francisco by the Customs officials of that port. One case of books from London which was sent via Panama and San Francisco was opened at the latter port in accordance with the United States regulations and without resoldering sent on a voyage of two thousand miles. These annoyances it is hoped will now cease, for it is understood that orders making more suitable regulations have been issued.

TABLE OF ATTENDANCE.

1900.	Whites.	Hawaiians.	Portuguese.	Chinese.	Japanese.	Others.	Days Open.	Closed Days.	Visitors on Closed Days.	Daily Average.		Totals.
										Open Days.	Closed Days.	
January	....	....	....	....	....	....	....	....	....	....	....	....
February	....	....	....	....	....	....	....	....	....	....	....	....
March	235	38	4	84	44	2	7	....	....	58	....	407
April	363	337	14	154	58	2	9	1	8	115	8	928
May	488	204	40	226	95	3	8	5	66	124	13	1056
June	434	115	59	132	79	5	10	10	72	75.4	7.2	824
July	272	58	19	133	107	....	8	4	44	68	11	589
August	238	70	38	143	76	2	9	4	15	61.3	3.7	567
September	334	114	30	81	90	1	9	6	90	62.2	15	650
October	335	127	8	95	37	....	8	4	74	66	18.2	602
November	342	104	8	63	33	....	9	5	37	57	7.4	550
December	396	152	31	102	86	....	9	3	15	84	5	767
Totals	3437	1319	251	1213	705	15	86	42	421	77.1	9.8	6940

Owing to the prevalence of the Bubonic Plague among the Orientals of this city at the beginning of the year this Museum was closed for two months and the Assistants were fully occupied as sanitary inspectors. During the rest of the year the single road between town and the Museum has been in a most disgraceful condition, at times even dangerous, and has doubtless had an effect upon the attendance at the Museum. The attendance of whites has slightly diminished, that of Japanese increased from the previous year. Schools have made use of both the collections and the publications in their courses, and it has been found necessary to regulate this attendance to prevent annoyance to other visitors.

Report of J. F. G. Stokes' Visit to the American Museums.

THE Trustees of the Bernice Pauahi Bishop Museum, deeming it desirable that I should become familiar with the arrangement of the larger American museums, decided to send me under the guidance of the Director, Mr. Brigham, on a short tour of inspection for this purpose through the United States. The time allowed did not permit of the most thorough examination, but the information gained and the many hints and suggestions taken advantage of, will no doubt be of value to our Museum in Honolulu. Attention was paid most particularly to the collections of Polynesian material, and when time did not permit the examination of specimens from places outside the Pacific region, these departments I was unfortunately compelled to pass unnoticed.

Much kind attention and great cordiality were shown by the gentlemen in the departments visited, and the willing help afforded was of the utmost value. Very many thanks are due these gentlemen for the assistance so readily given, and an opportunity is sought to show our Museum's appreciation for the kindnesses rendered.

The institutions visited were: The California Academy of Sciences in San Francisco; the Missouri Botanical Garden in St. Louis; the Smithsonian Institution, U. S. National Museum, Army Medical Museum, U. S. Botanical Gardens, National Zoological Gardens, and the U. S. Fish Commission building in Washington; in Philadelphia, the Academy of Natural Sciences, the Zoological Park, the Free Museum of Science and Art, the Philadelphia Commercial Museums and Memorial Hall at Fairmount Park; in New York, the Aquarium in Battery Park, Columbia University Library, the New York Zoological Garden and Botanical Museum at Bronx Park, the American Museum of Natural History and the Metropolitan Museum of Art; in Boston and Cambridge, the Boston Society of Natural History, Peabody Museum of Archæology and Ethnology, Museum of Comparative Zoology, the Museum of Fine Arts and the Boston Public Library. While in Rochester, N. Y., Ward's Natural History Establishment was looked through, and in Chicago the Field Columbian Museum was visited.

The California Academy of Sciences has done valuable work in increasing the knowledge of the natural history of the Pacific region, more particularly in the ornithological and conchological sections, in the latter branch having been assisted by the contributions of Messrs. Pease and Garrett in earlier days. I might mention here that the Garrett collection of shells is in the cases of the Bishop Museum. The bird collection was being well developed by the Curator, and the series of Pacific coast marine birds was very fine. The ethnological department had been much neglected through the want of individual attention, but the recent acquisition of an ethnologist from New York will no doubt result in the collection being placed in satisfactory order. Much time in future is to be given to the study of aboriginal life in California. The Polynesian collection was poor, which is very strange when the trade from San Francisco to the Pacific islands is taken into consideration.

Opportunity was taken to visit the Stanford University at Palo Alto, Cal., whence the benefit of Dr. Jordan's work in training young scientists is already widely felt. The study of fish is closely followed in this university, the laboratory of which was found to be as complete as modern improvements could make it. The University Museum has been carefully arranged and would rank mainly as a family museum, having no doubt been established to be of most interest to the Stanford students.

In St. Louis the beautiful and artistically arranged gardens of the Missouri Botanical Park were seen. This park originally belonged to a philanthropic botanist who bequeathed it to the state to be used as a public garden. That the responsibility of caring for the place was appreciated, was shown by the splendid order kept and the very complete naming of the plants. Adjoining the gardens was a large enclosure in which grew the larger American trees labelled with botanical and general names.

On arriving in Washington the Smithsonian Institution was visited. It was observed that one vast collection was preserved in the two buildings, the Smithsonian Institution containing the greater portion of the natural history collection, represented by the invertebrates, birds and fish (casts); the botanical portion was not seen. In this building was also a room given up to the stone and copper implements of the American aborigines. The National Museum was devoted to ethnology and anthropology, and the balance of the natural history collection comprising geological specimens, mammals and a great number of fish casts. The mode of mounting birds and mammals in groups is to be very highly recommended, as such a procedure calls for the keen observation which only the true naturalist can exercise. Of the fine groups of mammals in the National Museum, the most noteworthy was that of the bisons, where the imitation of nature was very good. There were other pleasing groups, musk-ox, antelope, caribou and moose. The collection of shells was a very valuable one, including as it did many specimens not duplicated in other institutions. However they were rather poorly exhibited on account of the lack of space, and only the kindness of the Curator, Dr. Dall, permitted the writer to obtain an adequate idea of the collection. The corals might well be increased in number, and no doubt the recent expedition of the Albatross (1899) will contribute to this department. The ethnological collections from the Pacific region were scant, although very valuable, being composed largely of specimens gathered by the Wilkes Expedition in 1841-3. There were two large stone images from Rapanui, which the museum was fortunate in possessing, and other objects from this island were fairly plentiful. The Australian and Papuan collections needed increasing, and satisfactory exchanges could be effected with the Australian museums. Of American aboriginal pottery and basket work there was great abundance, as also other specimens pertaining to American ethnology. The groups of aborigines performing home duties are worthy of especial notice. Series showing the evolution of the axe, hammer and other tools from their most primitive forms to the modern types, were admirably illustrated. There was one room which contained a large series of boats, showing every form from the dugout canoe to the modern steamboat and sailing vessel. The canoes and small boats were represented by originals, and models took the place of larger vessels. The geological collections were large and comprehensive, and the specimens displayed in a way which thoroughly showed the character of each.

It seemed strange after visiting the Capitol and Congressional Library in Washington and noting the undoubted architectural and artistic skill of Americans, that the magnificent collection in the Smithsonian Institution and National Museum should not be housed in a building more befitting the dignity of the United States' capital. Against the arrangement of the specimens in the National Museum nothing could be said, although in the Smithsonian Institution many specimens would be invisible without the aid of electric light, but the buildings should be of far grander and more magnificent style so as to be worthy of the capital of the great United States of America.

The U. S. Army Medical Museum contained many anatomical preparations of great value to the medical student. This museum also contained two tatooed and dried Maori heads from New Zealand, and it would seem more fitting if these specimens were placed with some museum for anthropology, where they would be highly valued.

It was rather an unfortunate time of the year (September) to visit the U. S. Fish Commission, as the breeding season had not commenced and the collections were not fully represented. The conveniences for taking care of the fish in all stages of growth were noted with much interest.

The National Zoological Gardens are situated near Chevy Chase, and the site chosen for this park showed that there had been great forethought in the selection of a place not only suitable for its purpose, but containing the great advantage of natural scenery. There was a fine herd of bison roaming in their extensive run. The aviary was large and kept in good order, and the reptile house well stocked. A neatly arranged aquarium was seen on the grounds, constructed on modern plans, and the mammal house contained a very representative collection. The confined inmates of the park were looking very healthy, with rare exceptions, and the care apparent on every side did great credit to the gentlemen in charge.

Reaching Philadelphia, a visit was first paid to the Academy of Natural Sciences, where Dr. Pilsbry had the kindness to accompany me when looking through the magnificent collection of molluscs in his charge. This collection, it is generally admitted, is the finest in the United States, although the Smithsonian Institution has many rare specimens not represented in this Academy. The convenient method of keeping the duplicate species in drawers below the exhibition cases would assist the work of the conchological student very much. In other branches of natural history also there were excellent opportunities for study, the working collections being well supplied and conveniently stored. In ethnology, the collection from the Pacific was not large, nor in fact was any pertaining to countries outside America. The Academy held a collection of very fine Hawaiian Kapa, which probably, on account of the space required, will never be exhibited in a satisfactory way. It was interesting to notice the similarity between some of the discoidal stones from Georgia and Alabama, and the ulumaika or bowling stones of the Hawaiians. The arrangement of the exhibits was good, as far as the specimens themselves were concerned, but great trouble was experienced in viewing them clearly owing to the darkness of the rooms—darkness due partly no doubt to the dull weather then prevailing, but in a greater degree to the building itself.

The Zoological Park has been placed in a spot possessing many natural advantages. It has been well arranged, and the comfort of the installation and the convenience of the visitors have been equally well attended to. The tank for the sea-lions with its hollowed rock in the middle, was an example of the careful planning of the place, and it was interesting to learn that the waterfowl on the small circular lake had been domesticated enough to begin to breed. Many rare animals and birds were seen here—among the birds the *Cercopsis novæ-hollandæ* being represented by two specimens alive. Considerable time was spent in the reptile house, where the Superintendent had been passing his spare time in casting and coloring different American snakes, and, for preserving the form, the advantage of snake casts over mounted skins is undoubted. The coloring of casts requires much patience and care in using the sombre shades.

A very brief visit was paid to the Philadelphia Museum at the Memorial Hall, Fairmount Park, containing many exhibits collected during the Centennial Exposition, 1876, but, although many beautiful things were seen, time was too limited for a close examination.

I was much pleased with the artistic arrangement of the Free Museum of Science and Art, and very interested in the theories of the Curator, Mr. Stewart Culin. The museum was rich in archæology, containing many steles and altars from Central America, and was also the depository for the collections made by the Babylonian expeditions under Dr. Hilprecht. In the ethnological section Mr. Culin's principles were rigidly adhered to, and it contained specimens which form, metaphorically, links of a chain connecting many widely separated countries.

The opportunity was taken to visit the Philadelphia Commercial Museum, an institution founded for the purpose of aiding the American merchant when extending his business to foreign countries. It had correspondents in every large city in the world and I was personally able to verify the information received from a town in Australia in which I had lived many years. In the museum, articles of ordinary use were shown in every stage of manufacture, and the young business man could, without leaving the building, learn how everything manufactured which he consumed, was made. In addition to this, the products of different countries were grouped together, so that a man could see enough to judge the opportunity of trade with any country previously unknown to him. An inclination was at one time apparent to include in this institution's publications papers concerning the study of zoology, but the management finally decided to confine itself to matters commercial. A suggestion was tendered by Mr. Brigham, that the institution enlarge its work a little and gather names of dealers in museum material, which suggestion was received favorably. The establishment of the museum is due entirely to the great energy expended by Dr. W. P. Wilson, to whom the merchants of the United States should feel very greatly indebted.

In New York, some time was spent in the New York Aquarium at Battery Park. The aquarium building as is generally known, was a fort called Castle Clinton, which has been modified sufficiently to make a very neat and suitably constructed aquarium. There were several large tanks built in the floor for large fish and seals, while the glass-faced tanks for the smaller fish were arranged in two tiers around the circular building. Originally Castle Clinton stood on an island some distance from the shore, but the land at this part of the harbor has been reclaimed and extended so as to bring the building within the beach line. In the reclaimed land wells have been sunk, and from these the salt water supply was obtained, the wells being repleted by the filtration into them of sea water Apparatus was provided for heating and cooling the water supply, so that the temperature could be adjusted to meet the needs of tropical fish as well as those requiring cool water, at any season. The vegetable growth in some of the tanks looked healthy and some pretty views of submarine life were available by means of this addition. The aquarium was not as rich as expected in the variety of its collection; it had a good supply of the American fishes, more particularly those used for food, but a larger representation of tropical fish would add to its attractiveness and the public interest generally.

At Bronx Park, New York, the first institution examined was the New York Zoological Park. This park was in process of construction. One of the permanent buildings completed was the reptile house, in the construction of which much consideration had been given to the accommodation of the inmates and convenience of the working staff. The first compartment entered contained the cages for reptiles from the temperate zones lining the walls. This appartment led into one four times the size in which the collection of tropical reptiles was found; two sides and an end of this room were reserved for cases, while at the other end was a large tank for the saurians. In the middle of the hall were two large tanks for turtles, the smaller containing salt water for marine turtles, and the larger divided into several compartments for terrapin and supplied by a stream of fresh water. Arrangements were made for heating the appartment with hot water. Behind the crocodile tank was a small conservatory in which the tropical plants cultivated throve luxuriantly. Outside the reptile house and convenient to it was a large basin intended as the summer residence of the Crocodilia. It was understood that the reptile house of the Zoological Society of London was taken as a model for the Bronx Park establishment, and the internal arrangement of the latter was certainly most admirable. The ranges for the hoofed animals, stretching along the western and southwestern borders of the park, had already been partitioned off with a high fencing of wire, and temporary shelters had been provided for the animals already in the collection. The American Ungulata were represented very fully. Among the Carnivora, the wolves, foxes and bears were provided with dens, the bears' den having been blasted out of the rock and built up with cement, and the others generally constructed of wood: strong iron railings with the upper ends turned inwards as usual, insured the safety of the visitors. The sea-lions had their pools, and looked as comfortable as on the rocks outside San Francisco. Several of the aviaries were completed, the finest of which was the flying cage, 150 feet long and 50 feet high; it contained herons, storks and ibises. The house for the smaller mammals was ready and filled, while permanent structures had not yet been erected for members of the cat family. Very great credit is due to Mr. William T. Hornaday, the director, for the way in which the work has been carried on, and under his care the park bids fair to surpass anything of a like construction in the United States. The plans were on a scale which should make it the beau-ideal of a zoological park.

Remaining within the confines of Bronx Park, a short visit was paid to the New York Botanical Museum, Gardens and Conservatory. The interior of the museum had lately been completed, and some of the space for exhibition still waited to be filled. The botanical specimens were arranged for the convenience of students of botany and commercial people, in the latter connection most vegetable products used in manufactures being shown in the raw state with, near-by, the sketches and names of the plants producing them. A very nice arrangement was made for the young student—about a dozen good microscopes were placed in a room, showing portions of various plants, the slides being changed from time to time. By this arrangement, any one interested in botany, unable to afford the cost of a good microscope, could glean a practical knowledge difficult to obtain in other ways. The system of providing microscopes for the public in this way might advantageously be adopted by other institutions. In the portion laid out as the garden, a classification of the beds was made according to the families and genera of the plants, thus giving a student the text-book illustrated by Nature. The conservatories, just completed, were being prepared for the reception of the plants allotted to them. This institution has already commenced to publish botanical information, six bulletins having left the printer's hands.

The next institution to be visited was the American Museum of Natural History, in Central Park. This museum will, when completed, be the largest in the United States, and though but one-third of its plan has been carried out, it now approaches in size the National Museum in Washington, the collections however not being as valuable as in the latter institution, excepting those of vertebrate, paleontology, mammals and birds. These last three collections in the Museum of Natural History deserve particular notice, not only on account of their value scientifically, but also of the skilled and artistic methods adopted in their mountings. The expeditions which the Department of Paleontology has been enabled to send out for dinosaurs and fossil mammals, have been doing excellent work, and the number of new species thus obtained was very considerable. The needs of the working student have not been overlooked, and several skeletons have been mounted so that individual bones could be removed for study without disturbing the others. Very fine bird groups were exhibited, among others, the Duck Hawk Group being very remarkable. In mounting groups, more attention has been paid to those of North America; each group was composed of the male and female, with the nest and eggs, their home surroundings being imitated in a way which showed how near Art was to Nature. The same could be said of the mounting of the mammals; two large groups in particular, of moose and bison, were reputed to be the best in the world. The Archæological Department has been well arranged, and was very rich in collections from Central America and Mexico. Much attention has been paid to these localities, and where an important specimen has been unobtainable for the museum, it was represented by a well executed cast. In ethnology, some very fine collections from the Pacific region were viewed. A collection had lately been purchased, and an experiment was being made of carding the specimens on dark buff boards—the specimens thus mounted looked very well but required such a large space that it has yet to be ascertained if the extra expense and additional room needed will justify this method. A very neat and effective way of mounting the butterflies has been adopted: plaster tablets faced with glass enclosed the insects, and in order to show the back and underpart, two tablets were used for each species. This method, too, requires very much room, although making a pleasing exhibit for the public. The museum has spent much time in order to please the people of New York, and many special collections were exhibited to show forms of life found within a radius of fifty miles from New York City.

In Boston, the Society of Natural History was visited, and the museum had an appearance of long standing. The material seen in it must be of great value, although overcrowded. This society has issued many very valuable publications.

The Peabody Museum of American Archæology and Ethnology held in its halls among other fine collections, very good ones of ethnological material from the Pacific region, including rare specimens from the Hawaiian, Fijian and Marquesan Islands. Its collection of archæological specimens was very rich. The cases for exhibition were well planned, and each specimen could be seen with ease if the background of the cases were of a lighter color.

The Museum of Comparative Zoology was undoubtedly the most admirable institution for the study of zoology seen on the trip. The classification and arrangement approached perfection, and the amount of information placed in the cases was very great. Series were made illustrating the morphology of many different species, and in other cases types of genera and species had been selected and carded dissected. An excellent series of radiates were shown by the glass models made by the Blatscha Bros., and the alcoholic specimens were on view in another department. The museum possessed a giant spider crab from Japan (*Kæmpferia kæmpferi*), nearly as large as that in the Bishop Museum.

At Rochester, N. Y., Ward's Natural History Establishment was visited for the purpose of obtaining an insight to the most modern methods of mounting specimens. The workshops were examined, and the work appeared to be carried on in a very systematic and thorough manner. Several useful suggestions were kindly given by the Messrs. Ward.

In Chicago a little time was spent in the Field Columbian Museum, and while the collections were large, comprehensive and valuable, the arrangement of some left much to be desired. It would seem that little attention had been paid to the correct identification of the ethnological specimens, for many common things were found incorrectly labelled, and those which were labelled aright were not classified in anything like a satisfactory manner. The birds were nicely classified, and several very good groups were seen—some of the collection however was in such darkness, that the specimens were hardly visible. One section contained specimens illustrating all the modes of locomotion on land, including models or originals of the different types of railway engines—this department was very interesting. The museum was in one of the buildings remaining from the Columbian Exposition in 1893, and contained many of the exhibits from that fair—these latter constituted the greater part of the collection.

The journey has been very interesting and instructive, and many things were learned which will no doubt be of value in the future arrangement of the Museum.

Report of a Mission to Guam.

BY ALVIN SEALE.

PART I.—AVIFAUNA.

THE Marianas or Ladrone Islands consist of twenty-one small volcanic islands which extend on a north and south line for a space of about 400 miles. They were discovered by Magalhâes, March 6, 1521. For the most part they present a bold rocky coast line with high hills or low mountains rising in the interior. They are densely wooded, except on top of the mountains, where it is usually barren, or covered with tall grass.

My actual field work was confined to the island of Guam, which is the largest and southernmost of the group, being thirty-two miles long by twelve broad. This island is densely wooded, except in the northwest, where there is a small range of low mountains reaching to an elevation of 1800 feet. The general height of the island is from fifty to seventy-five feet, with a few small fresh water ponds and marshes, and perhaps eight or ten small streams.

In this paper I have followed as near as possible the A. O. U. code of nomenclature. The key, inserted for the convenience of fellow-workers in Polynesian ornithology, is chiefly compiled from various works of worth bearing on the subject. The measurements are all in inches, and like the color notes were taken from specimens in the flesh, *i. e.*, in all the Guam specimens. Unless a specimen is marked "*Immature*" an adult bird is to be understood. The local names given in Vol. V., Nov. Zool., all have a curious Japanese twist to them, and with one exception are all incorrectly spelled. The native names as herein given were all revised by Lieutenant-Governor Safford of Guam, who is the best living authority on the Chamorro language.

KEY TO ORDERS.

a^1. Toes four, all fully connected by web. Order **Steganopodes.**

a^2. Toes four, hind toe not connected with front ones; bill with cutting edge fringed or dentate...........Order **Anseres.**

a^3. Toes four, all on the same level; bill short, strongly hooked, and with a cere at the base of the upper mandible. Order **Raptores.**

a^4. Toes three, or if four the hind one not connected by web with the inner toe.

> **b^1**. Nostrils tube-shaped, feet webbed.....Order **Tubinares.**
>
> **b^2**. Nostrils not tubular, anterior toes webbed, tarsus shorter than the tail..................Order **Longipennes.**
>
> **b^3**. Nostrils not tubular, anterior toes not broadly united by web, the lower portion of the thighs naked, or else the bill is lengthened and grooved along each side, outer and middle toes separate.
>
> > **c^1**. Hind toe long and on the same level as the front toes, loral or orbital regions naked. Order **Herodiones.**
> >
> > **c^2**. Hind toe short and on same level as front toes, or but slightly elevated; if long as lower mandible there is a frontal shield present.....Order **Paludicolæ.**
> >
> > **c^3**. Hind toe short and below the level of the front toes. Order **Limicolæ.**
>
> **b^4**. Nostrils not tubular, the lower portion of the thighs feathered, or else the middle and outer toes are united for at least half their length.
>
> > **c^4**. Hind toe small and elevated, or else bill is without a soft cere, bill not hooked, short and stout. Order **Gallinæ.**
> >
> > **c^5**. Hind toe well developed and on a level with the anterior toes, bill with a soft swollen cere at the base of the upper mandible..........Order **Columbæ.**
> >
> > **c^6**. Bill without soft swollen cere.

d[1]. Wing very long, about equal to the total length of the bird, which does not exceed 4.50, primaries ten, secondaries six.
Order **Macrochires.**

d[2]. Wing shorter, equal to about one-half the total length of the bird, bill large, primaries nine.
Order **Coccyges.**

d[3]. Wings not very long, toes three in front and one behind, the middle and outer toes not united for half their length, lower part of thighs feathered, the tarsus equal to or longer than the lateral toes.............Order **Passeres.**

Order LONGIPENNES.—Long-winged Swimmers.

a[1]. Bill without cere, lower mandible not longer than upper, tail feathers twelve, claws feeble or moderate. Family *Laridæ*, Gulls and Terns.

b[1]. Tail even, hind toe perfectly developed but small, culmen more than two-thirds as long as tarsus. Genus *Larus*.

b[2]. Tail graduated.

c[1]. Outer tail feathers broad and rounded at tip.

d[1]. Wing less than 9.5, general color black, wings lighter. Genus *Hydrochelidon*.

d[2]. Wings more than 9.5, general color, including wings, a sooty black. Genus *Anous*.

c[2]. Outer tail feathers sharp, pointed, the next to the outer pair the longest, general color pure white. Genus *Gygis*, Wagler.

GENUS **LARUS** LINNÆUS.

1. **Larus vegae** (Palmen). **Pallas' Gull.**

Mantle light gray or pearl gray; no black spot on the bill of the adult. Length 26, wing 15.15–18.30, culmen 1.90–2.20, tarsus 2.15–2.20. *Hab.* Pacific Ocean, probably accidental on the Marianas, only one specimen having been taken there, which is now in the Paris Museum.

GENUS **HYDROCHELIDON** BOIE.

2. **Hydrochelidon leucoptera** (Temm.). **White-winged Black Tern.**

General color black, silvery and white on wings; young and winter specimens with tail and under parts white. Length 9.3, culmen 1.1, wing 8.2, tail 3.1, tarsus .75, mid-toe and claw 1. *Hab.* (Doubtful) Parts of the Australian and American coasts.

GENUS **ANOUS** LEACH.

a[1]. Forehead alone is distinctly whitish. *Anous stolidus*, Linn.

a[2]. Entire top of head whitish, the white changing gradually into ashy on the hind neck. *Anous leucocapillus*, Gould.

3. **Anous leucocapillus** Gould. **Black-cheeked Noddy.**

Lores jet black, cheeks dusky, upper and under parts nearly black, tarsus and toes dark brown. Length 13, culmen 2, wing 9, tail 5, tarsus .9, mid-toe and claw 1.4. *Hab.* Inter-tropical Atlantic, Australia, and Pacific islands. Probably resident on the island of Saipan, Marianas.

4. **Anous stolidus** (Linn.). **Fahan. Noddy.**

The Noddy, Catesby, Nat. Hist. Carolina, 1737, I., p. 88.
Sterna stolida, Linn., Syst. Nat., 1758, ed. XI., p. 173; Kittl. Kupfertaf, III., p. 27.
Anous stolidus, Gray, Gen. B., p. 100; Saunders, Cat. Brit. Mus. B., XXV., p. 136; Wiglesw. Av. Poly. Ber. abh. u. Mus. Dresden, 1890-91, p. 76; Rothschild, Av. Laysan, 1893, I., p. 41; Hartert, Nov. Zool., 1898, V., p. 68.
Anous stolidus pileatus (Scop.), Hartert, Nov. Zool., VI., p. 9.

The natives tell me this bird is very abundant on the island of Saipan. In Guam it is not very common; a few were seen on the cliffs near the entrance of the harbor of San Luis de Apra. The five specimens secured were shot on the northeast end of the island, where a small number were seen flying along the beach. These specimens are much darker in color than those from Laysan and Oahu, H. I. The measurements were as follows:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9589	June 14	11.15	6.50	2.75	1.06	1.18	1.62	im. ♂
9590	June 15	17.00	11.25	6.62	.95	1.53	1.55	♀
9591	June 16	17.05	10.87	7.00	.90	1.59	1.64	♂
9592	June 23	17.05	11.16	6.00	1.00	1.59	1.63	♂
9593	June 23	17.00	11.00	6.45	1.00	1.63	1.55	♀

One specimen, No. 9589, was a young male, the color of which was not so dark as in the adults; the gray coloring is restricted to the forehead; there is a white superciliary band extending from posterior of the eye to the upper mandible. The chin has not yet acquired the brown feathers of the adult, but is still covered with a gray down. There is a dark wing bar on top of wings. *Hab.* Tropical and juxta-tropical seas.

GENUS **GYGIS** WAGLER.

5. **Gygis alba kittlitzi** Hartert. **Chung. White Tern.**

Gygis alba kittlitzi, Hart., Vogels. Mus. Senckenb., p. 237; *Id.* Nov. Zool., V., p. 67.
Sterna nivea, F. Bennett. Whaling Voy., 1840, I., p. 37.
Gygis candida, Wagl., Isis, 1832, p. 1223; Finsch, Ibis, 1880, pp. 330, 434; Tristr. Ibis, 1881, p. 251; Saunders, Cat. B. Brit. Mus., XXV., p. 149.
Gygis alba, Licht., Nomencl. Av., 1854, p. 97; Finsch, Journ. Mus. Godef., 1875, VIII., p. 43; Roth. Avif. Laysan, I., p. 35 (pl. and eggs).

Chung, the White Tern, is an abundant bird on Guam and undoubtedly nests on the island, although I did not succeed in finding the eggs. They congregate in the breadfruit trees in the midst of the jungle, and the beauty of their pure white plumage among the green leaves is very striking:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9578	June 10	12.75	9.50	4.68	.56	1.60	1.15	♂
9580	June 16	12.50	9.50	4.68	.53	1.54	1.12	♂
9581	June 16	12.25	9.50	4.50	.53	1.50	1.12	♂
9583	June 16	12.75	9.50	4.50	.56	1.50	1.16	♀
9584	July 11	13.00	9.75	4.80	.50	1.60	1.15	♂
9579	June 15	13.00	9.75	4.75	.56	1.63	1.16	♂

The spread of the wings is about 26, and the depth of the bill at the nostrils is .31–.33. The entire plumage of the adult is ivory white with the exception of a very narrow dusky ring around the eye. The shafts of the primaries are gray; the feet and tarsus are blue with white webs, which are deeply incised; the bill is blue, darker at tip; eyes brown. In the dry skins the color of the bill becomes much darker, and the webs fade into a pale yellowish, but the toes retain their blue color and are never dark brown as given by Saunders (Brit. Mus. Cat. B., XXV., p. 150), or black as given by Rothschild (Avif. Laysan, I., p. 36). In this last citation the length of the bill is given as 0.4–0.5!—doubtless a printer's error. Two specimens of this tern, taken by H. C. Palmer on Laysan Island June, 1891, give the following measurements: Length (skins) 12.75, wing 9.75 and 9.60, tail 4.62 and 4.35, tarsus .50 and .52, mid-toe and claw 1.15 and 1.11, culmen 1.40 and 1.55, its depth at nostrils .30 and .31. *Hab.* Polynesia.

Order TUBINARES.—Tube-nosed Swimmers.

a¹. Wings large, over 19, upper mandible hooked, nostrils of two distinct tubes. Family *Diomedeidæ*.

a². Wings smaller, less than 19, nostrils united in one tube with two barrels. Family *Procellariidæ*.

FAMILY **DIOMEDEIDÆ**.—ALBATROSSES.

GENUS **DIOMEDEA** LINNÆUS.

6. **Diomedea nigripes,** Aud. **Black-footed Albatross.**

General color uniformly dusky; tail coverts, base of tail, and forehead white; bill dark brown; feet black. Length 28–36, wing 18.50–20, culmen 4–4.50, tarsus 3.50–3.70, mid-toe and claw 4.05–4.40. *Hab.* Pacific Ocean generally, south to the Line; accidental in the Marianas. "One specimen in the Paris Museum."

FAMILY **PROCELLARIIDÆ**.—PETRELS.

GENUS **PUFFINUS** BRISSON.

a¹. Tarsus less than 1.65.

b¹. Sides of neck and breast slaty, bill .90–1. *Puffinus tenebrosus*.

b². Sides of neck mottled, breast and under neck white, bill 1.50. *Puffinus obscurus*.

7. **Puffinus tenebrosus** Pelz. **Pelzeln's Shearwater.**

Upper color sooty black, sides of neck and breast slaty with whitish margins to the feathers. Length 12, wing 7.20–7.80, tail 2.95–3.25, culmen 1–1.05, tarsus 1.40–1.45, mid-toe and claw 1.50–1.60. *Hab.* Coast of Australia.

8. **Puffinus obscurus** Gm. **Dusky Petrel.**

Probably same as above. Length 12, wing 7.8, tail 3.2, bill 1.5, tarsus 1.5, mid-toe and claw 1.6 (Samoan Islands). *Hab.* Tropical and sub-tropical seas.

Order STEGANOPODES.—Totipalmated Swimmers.

a¹. Nostrils distinct, bill sharp-pointed without hook, chin feathered, tail short, graduated, in the adults the two middle feathers are greatly elongated. Family *Phaëthontidæ*.

a². Nostrils not distinct, head partly naked, bill stout but not hooked, tail about half as long as wing. Family *Sulidæ*.

a³. Nostrils distinct, bill hooked at tip, lores feathered, upper plumage black, tail forked, wing long. Family *Fregatidæ*.

FAMILY **PHAETHONTIDÆ**.—TROPIC BIRDS.

GENUS **PHAETHON** LINNÆUS.

9. **Phaëthon candidus** Temm. **Boatswain Bird. Tropic Bird.**

General color pure white; a black band bordering both sides of the head, passes through the eye, and terminates in a crescent-shaped mark at gap; a black band on the wings. Length 30, culmen 1.8–2, wing 10–10.6, tail 17.3–21, tarsus .8–.9. The young are barred with black. *Hab.* Inter-tropical seas, except coast of North America. "Resident on Agrigan, of the Marianas."

FAMILY **SULIDÆ**.—GANNETS.

GENUS **SULA** BRISSON.

a¹. Feet greenish or yellowish; head, breast, neck and upper parts brown. *Sula sula*.

a². Feet always reddish, head and neck white, tinged with buff; general color white. *Sula piscator*.

10. Sula sula Linn. Luau. Booby. Gannet.

Pelecanus sula, Linn., S. N., 1766, I., p. 218.
Sula fusca, Vieill., Gal. Ois., 1825, II., p. 194, pl. 277; Swinh. Ibis, 1869, p. 347 (Formosa); Tristram, Ibis, 1882, p. 144, Solomon Islands.
Sula fiber, Cassin (aft. L.) U. S. Ex. Exp. 1858, p. 363.
Sula leucogastra, Sclat. & Salv. P. Z. S., 1873, p. 651; Seebohm, B. of Jap., p. 12.
Sula Sula, Verr. & Des Murs. Rev. Mag. Zool., 1860, p. 442; Ridg. Man. N. A. B., p. 75; Roth. Avif. Laysan, I., p. 29; Hartert, Nov. Zool., V., p. 69; Oust. II., p. 63; Cat. B. Brit. Mus., XXVI., p. 436.

Only one specimen of the Booby was secured, although they were not at all rare. This bird was taken July 23 and proved to be an adult male. They were usually to be seen flying about the cliffs near the entrance to the harbor of San Luis de Apra. Length 30, spread of wing 4 ft. 10 in., wing 16, tail 7.75, tarsus 1.62, culmen 3.56, its depth at nostrils 1.36, mid-toe and claw 3.59. The general upper coloring, including head, neck, and fore breast is a fine uniform seal brown; hind breast, belly, under tail coverts, sides, flanks, thighs, axillaries, and under wing coverts of the secondaries, pure white; shafts of the primaries black on the upper surface, gray below; bill flesh color, with grayish tint, bluish at tip; feet and tarsus a livid light-green; iris a silvery grayish. This specimen is much darker than the summer specimens from Laysan Island. The posterior half of the primaries are especially dark brown as compared with the Laysan birds, as is also the head, neck and breast. *Hab.* Tropical and sub-tropical seas throughout the world, except the Pacific coast of America.

11. Sula piscator Linn. Red-footed Booby.

The general plumage of this species is white; feet always red; gular sac blackish; bare skin in front of eye red; tail white. Total length 27–30, wing 15–16, culmen 3.50. *Hab.* Inter-tropical seas, north to Florida and Lower California.

FAMILY FREGATIDÆ.—MAN-OF-WAR BIRDS.

GENUS FREGATA CUVIER.

a^1. Wing more than 21.5, culmen not less than 4.15. *Fregata aquila*, eill.

a^2. Wing less than 21, culmen less than 4.15. *Fregata ariel*, Gould.

12. Fregata aquila (Vieill.). Frigate Bird.

Man-of-war Bird, Edwards, Glean., 1860, II., p. 209.
Pelecanus aquilus, Linn., S. N., 1766, I., p. 216.
Tachypetes aquila, Vieill., N. Dict d'Hist. Nat., 1817, XII., p. 146.
Fregata aquila, d'Orb., Sagras Hist Cuba, 1839, p. 309; Rothschild, Avif. Laysan, 1893, I., p. 21; Cat. Brit. Mus. B., XXVI., p. 443.

An adult male specimen of this bird was shot by a native November, 1899, and brought in to Lieutenant-Governor Safford, by whom it was identified. The skin was not saved, but the skeleton was presented to the Bishop Museum by Lieutenant Safford

(No. 9608). This is the first record of this species from Guam. *Hab.* Tropical and sub-tropical seas.

13. **Fregata ariel** Gould. **Australian Tropic Bird.**

General color greenish black, a white patch on each flank. Wing 19.2–21, tail 15–17, culmen 2.8–3.3. The female is a little larger, with breast and sides white, and a white collar at the rear of the neck. The young have the head and neck white ; a general coloring of brown ; the middle of the abdomen and the flanks white. *Hab.* Tropical Pacific and Indian Ocean.

Order ANSERES.—Lamellirostral Swimmers.

a^1. Hind toe without membranous lobe or flap. Sub-family *Anatinæ*.

a^2. Hind toe with a broad membranous flap or lobe. Sub-family *Fuligulinæ*.

SUB-FAMILY **ANATINÆ**.—FRESH WATER DUCKS.

GENUS **ANAS** LINNÆUS.

14. **Anas oustaleti** Salvad. **Ngang. Ladrone Duck.**

Anas oustaleti, Salvad., Bul. Brit. Orn. Club, XX.; p. 1 ; *Id.*, Cat. B. Brit. Mus., XXVII., p. 189; Hartert, Nov. Zool., V., p. 66 ; Oust., II., p. 49.

This duck nests among the reedy swamps and streams of the island, and is not uncommon all the year round. The specimens secured were taken during the month of June. The general color of the upper surface is dark brown, the feathers margined with buff ; top of head dark brown with a slight greenish tint ; in some specimens the crown is slightly sprinkled with a few small buffy feathers ; a pale buffy stripe extending from base of upper mandible over the eye to back of head ; below this there is a dark stripe extending from the base of the upper mandible through the eye to the back of the head ; sides of the head, and neck, buffy with streakings of brown ; the throat buff, not streaked ; under parts not so dark as the upper, the buffy tips of the feathers being longer and wider, but not so bright ; wings a soft dark brown, the secondaries more or less edged with buff ; speculum bluish-purple, green in some lights ; it is bordered by black, followed front and back by an indistinct white or buffy line, as in *A. wyvilliana* of Hawaii ; the white markings, however, are not so prominent as in the latter ; bill dusky above, with small black splotches ; the lower mandible lighter (No. 9534 has bill entirely black); feet and tarsus flesh color with a tint of pink ; eye light hazel. Length 19.50–20, spread of wings 32, wing 10–10.50, tail 2.25–2.50, tarsus 1.63–1.85, culmen 1.75–1.80, its depth at nostrils .68, mid-toe and claw 2.45–2.50. *Hab.* Guam and Saipan, also probably others of the Marianas. Two of the downy young were secured, the general upper coloring of which is brown; there is a buffy spot on each side of the rump; the throat, neck and general under coloring is buffy; a wide and distinct superciliary line of buff; a black line from the upper mandible through the eye; there is a splotch of brown at the nape and another on the sides of the head below the ear; upper mandible black, lower yellowish; feet brownish.

SUB-FAMILY **FULIGULINÆ**.—SEA DUCKS.

GENUS **FULIGULA** STEPHENS.

15. **Fuligula fuligula** Linn. **Tufted Duck.**

General color black, abdomen white; tail feathers normal, not particularly stiff; head with crest; speculum white. Wing 8, tail 2.5, culmen 1.75, tarsus 1.12. General color of young and females brown. *Hab.* Palæarctic regions from the Atlantic to the Pacific; winters in China, Japan and India; accidental in Polynesia.

Order HERODIONES.—Herons, Storks, Bitterns, Etc.

a^1. Bill sharp-pointed and nearly straight, inner side of middle toe-nail pectinate, loral space bare, powder-down tracts present. Family *Ardeidæ*, Herons.

b^1. Tail feathers 10, bill with serrations, slightly notched.

c^1. Length about 21, yellowish band down sides of neck, culmen longer than tarsus. Genus *Dupetor.*

c^2. Length about 14, tibio-tarsus feathered to heel. Genus *Ardetta.*

b^2. Tail feathers 12 or more, bill without serrations, and usually with a distinct notch, culmen longer than tarsus, length about 22. Genus *Demiegretta.*

GENUS **DUPETOR** HEINE & REICHENBACH.

16. **Dupetor flavicollis** Lath. **Yellow-necked Bittern.**

Ardea flavicollis, Lath., Ind. Orn., 1790, II., p. 701.
Ardea picata, Raffl., Trans. Linn. Soc., XIII., p. 326.
Ardea bilineata, Cuv., Mus. Paris.
Ardeiralla flavicollis, Salva., Ucc. Born., 1874, p. 353; Oates, Journ. Straits Branch As. Soc. B. 1990, III., p. 251.
Dupetor flavicollis, Hein. & Reichen., Nomencl. Mus. Hein., 1890 (Sumatra), p. 308; Sharp, B. B. O., Club, XXXI., p. 31; *Id.*, Cat. B. Brit. Mus., XXVI., p. 247.

Only one specimen of this large bittern was seen. This was shot near the Agaña river June 11, 1900, and proved to be a full grown female (Bishop Museum No. 8986). Length 22.25, spread of wings 28, wing 8.15, tail 2.92, tarsus 2.43, culmen 3.00, its depth at nostrils .57, mid-toe and claw 2.86. General color of the upper surface olive brown with a slight rufous tint, the under coloring of feathers slate; wings and tail slate; sides of face and cheeks black, mottled with rufous; sides of neck with bands of bright golden straw color; chin and under throat yellowish, with a line of dusky brown feathers extending down the center and broadening out to form the prettily variegated coloring of the under neck and fore breast, which have a general coloring of rufous brown with feathers edged with whitish black and buffy, giving the fore breast a streaked appearance; feathers of belly with under coloring of slate, but the outer half is brownish broadly edged with yellowish, which gives to the under surface a dirty yellowish and brownish appearance; sides and rump slaty; thighs and tibiotarsus rufous; bill dusky above, lighter below; feet a dirty brownish; eyes yellowish. *Hab.* Philippine Islands, China, Burmah, Java, Borneo, Celebes, Sumatra, Malay peninsula, India and Ceylon. This is the first record of this species from Guam.

GENUS **ARDETTA** GRAY.

17. **Ardetta bryani,*** spec. nov. **Kakak. Bittern.**

This little bittern is found in abundance along the streams and in the reedy marshes; taro patches and rice paddies are also its favorite feeding grounds. The native name of Kakak is a very good imitation of the cry it makes as it flys up when disturbed. The coloring of this bird blends so well with its surroundings that it takes very careful observation to see them, of which fact the birds seem well aware and remain perfectly still until they are almost stepped upon, when they fly up, calling out a loud "kaka-kakak". Their food is chiefly insects and their larvæ. Some of the specimens examined had their stomachs filled with black crickets. Eight specimens were secured, two adult males, two adult females, and four immature:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9600	June 5	13.50	5.25	1.68	1.86	2.00	2.12	♀
9601	June 7	14.25	5.46	1.56	1.86	2.00	1.92	juv. ♂
9602	June 12	14.75	5.00	1.65	1.86	2.00	2.60	juv. ♂
9603	June 12	14.00	5.50	2.00	1.92	2.00	2.17	♂
9604	June 11	14.00	5.50	2.00	1.92	2.00	2.17	juv. ♀
9605	June 11	14.00	5.12	1.80	1.88	2.00	2.25	♂
9606	June 13	14.50	5.25	1.75	1.75	2.12	1.96	juv. ♀
9607	July 3	14.25	5.60	1.60	1.89	2.10	2.17	♀

The spread of the wings from tip to tip is about 19; the depth of the bill at nostril is .40. No. 9603 is type of species. The adult males have the mantle, scapulars, lesser wing coverts and tertials a uniform reddish brown; anterior of mantle slightly darker, with a few feathers having dusky centers and rufous margins; forehead dusky with a slight mingling of rufous; crown and occiput black, the feathers forming a crest about three-quarters of an inch long; sides of head and neck rufous, the long frill-like feathers on the sides of the lower neck with a slight vinous tint; greater and middle wing coverts a light buff; primaries and secondaries slaty black, their under surface grayish, lighter at tips, the outer web of outer primary margined with buff; axillaries and under wing coverts pure white; bastard primary black with buffy outer web; primary coverts black; edge of wing white; tail feathers black, the upper coverts grayish with a slight rufous tint, under tail coverts buffy white; throat, under part of neck, and pendant feathers on under part of lower neck white with slight intermingling of buff; a buffy streak extending mesially down the chin and throat; sides of fore-breast with long dusky feathers having reddish buff margins; sides and belly white with a very slight tint of buff; thighs a buffy white; eyes golden yellow; feet and tarsus a yellowish green; bill dusky above, light below.

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* This is probably the *Petit Heron*, Quoy & Gaim., Voy. Uranie, 1824, p. 35 (Guam). Also the bird called *Ardetta sinensis*, Oust., Le. Nat., 1889. p. 261 (Iles Mariannes); Hartert, Nov. Zoöl., V., p. 63; Sharp. Cat. B. Brit. Mus., XXVI., p. 227.

The adult female has more red mixed with the black of the crown and occiput, the lower feathers of the crest being entirely rufous with vinous tint; the feathers of the back with lighter margins; general upper surface a dark cinnamon color; the wing coverts are slightly darker than in the adult male, the median streak on the chin is more pronounced, and there seems to be more buffy coloring on the throat and under side of neck, the thighs show more buffy. Otherwise the sexes are identical.

The immature birds are characterized by the streaked appearance of the crown, caused by the black feathers being margined with red. The feathers of the mantle and rump are also a darker reddish brown than in the adult bird; the feathers of the wing coverts are brownish margined with buff, the inner webs being more or less gray, the outer web of the tertials showing a coloring of vinous red; the sides are a darker buff than in the adult and the feathers of the under surface are colored in the centre with reddish brown which gives the under neck, breast and belly a more streaked appearance; eye yellow; bill dusky above, and light below.

This species is closely allied to *Ardetta sinensis* (Gmel.), but is easily distinguished by the uniform reddish brown coloring of the upper surface, the yellowish green of the tarsus, the rufous tint of the upper tail coverts, and the smaller size, the shorter tarsus, and slightly longer culmen, as shown in the table given above. *Hab.* Marianas. Named in honor of my esteemed co-worker in the ornithology of Polynesia, W. A. Bryan, of the Bishop Museum.

GENUS **DEMIEGRETTA** BLYTH.

18. **Demiegretta sacra** (Gm.). **Chuchuku. Reef Heron.**

Ardea sacra, Gm., Syst. Nat., I., p. 640; Finsch., Jour. Mus. Godef , VIII., p. 32; Scl., Challenger Exp., II., B., p. 31; Tristr., Ibis, 1882, p. 144 (Solomon Ids.).
Ardea jugularis, Forst., Icon. ined. tab. 114; Hartl., J. f. O., 1853, p. 167 (Mariannæ Ids.); Sharp, P. Z. S., 1887, p. 516 (Christmas Id.).
Herodias grayi, Gray, List. Grall. Brit. Mus., p. 80 (Aust.).
Demiegretta grayi, Gould, Hand. B. B. Aust., II., p. 309.
Demiegretta sacra, Wald., Ibis, 1873, p. 318; Grant, P. Z. S., 1888, p. 333; Sharp, Ibis, 1894, p. 245; Hart., Nov. Zool., V., p. 64; Cat. B. Brit. Mus., XXVI., p. 137.

The Reef Herons are not very abundant on the island, and they are extremely wild and difficult to approach. Three specimens were secured, one adult male and two adult females:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9585	June 10	25.00	11.50	4.00	3.25	3.37	2.90	♂
9587	June 11	24.00	11.00	3.35	3.50	3.12	2.60	♀
9588	July 14	24.00	11.00	3.68	3.00	3.30	2.86	♀

The spread of the wings is about 37.50, and the depth of the bill at the nostrils is .56. Sexes colored similarly. The general color of the adult is blackish slate; feathers of the crest and short back plumes tinged with gray in the fully adults; a white streak down the centre of throat, this streak in some specimens beginning between the gonys and extending three inches or more down the neck; in others the white streak begins on a line with the anterior of eye and is only about one inch in length. Specimens almost adult have scattered feathers of a dirty buffy white among the slaty plumage of the mantle, neck, and wing coverts; bill dark above and at the tip, under mandible dusky yellowish; feet and tarsus dusky yellowish green with dark splotches on the front of the tarsus; eye golden yellow. *Hab.* Australia, Pacific islands, Burmah, Malay peninsula, Korea, Bay of Bengal, Japan and China.

Order PALUDICOLÆ.—Rails, Coots, Etc.

Hind toe above the level of the others, toes long and slender, wings less than 10. Family *Rallidæ*, Rails.

a^{1}. Without frontal shield.

b^{1}. Length about 11, barred with black and white on the under surface, wing more than 3.9. Genus *Hypotænidia*.

b^{2}. Length about 7, under surface gray, not barred, wing 3.39 or less. Genus *Poliolimnas*.

a^{2}. With a frontal shield.

b^{1}. Middle toe longer than the tarsus, no webs or lobes on the toes, wing 6.92 or less. Genus *Gallinula*.

b^{2}. Toes with lobes on the sides, wing 7.70–8.30. Genus *Fulica*.

GENUS **HYPOTÆNIDÆ** REICHENBACH.

19. Hypotænidia oustini Oustalet. **Koko. Oustalet's Rail.**

Hypotænidia marchei, E. Oustalet, Arch. Mus. Paris (3), 1896, VIII., pp. 32–34.

General color above olivaceous brown; no white spots on mantle or back. In No. 9540 the ends of the feathers on the back of the neck are so worn that they give the appearance of yellowish markings to this region; rump brown; greater wing coverts uniform with the coloring of the mantle; lesser and median wing coverts barred with black and white; primaries, secondaries and tail feathers barred with black and white. This marking on the tail feathers, however, varies considerably. In No. 9536 the tail feathers are almost uniform ochraceous brown with but a few white dots on the webs; top and sides of head uniform with coloring of the mantle; but in No. 9531, however, they are a shade darker than the mantle. A sharply defined superciliary stripe of ashy gray extending from near the base of bill to the sides of nape, the anterior part of this stripe narrow and white. With the exception of this stripe the coloring of the sides of head and neck are uniform with mantle. Beginning sharply on a line with the gape and extending to the shoulders is the plumbous gray of the under neck and breast, merging into white on the chin. Two of the specimens, Nos. 9537 and 9540, show a slight trace of rufous in this plumbous gray of the fore breast. Beginning at the fore breast and extending over the entire under surface of the body, including flanks and under tail coverts, the bird is barred with black and white, these bars especially large and distinct on the flanks, while on the belly they are narrow and not so marked; bill dusky; feet grayish with brownish cast; iris an Indian red. I find no difference in the coloring of the sexes. No. 9538, a fledgling three inches in length, is covered with a uniform sooty black down; bill and feet dusky; eyes dark brown. This bird is closely allied, if not identical with *R. philippinas*. It seems, however, to be a little larger, and without the rufous coloring on the flanks. *Hab.* Marianas.

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9536	June 24	11.50	4.48	2.06	2.84	1.37	1.84	♀
9537	June 23	13.00	5.18	2.19	2.86	1.62	2.12	♂
9539	July 9	11.00	....	1.68	1.95	1.50	1.55	♀
9540	July 15	11.50	4.50	2.00	2.00	1.50	2.10	♀

GENUS **POLIOLIMMAS** SHARP.

20. Poliolimmas cinereus Veill. **Gray Rail.**

Porphyrio cinereus, Veill., Nouv. Dict., 1819. XXVIII., p. 29.
Poliolimmas cinerea, Sharp, Bul. Brit. Orn. Club, 1893, V., p. 28.

The natives call this bird the Koko, the same name they give to the big Oustins Rail, and they regard it as the young of the latter, which is not at all the case, as the specimen I secured of *P. cinereus* was a fully adult female, with eggs almost ready for laying. These birds are quite rare, and the only specimen I secured was a female which had been snared by some native boys in a sweet potato patch near the Agaña river. General color above olive brown; on top of head the middle of feathers black, with the edges olive brown; a slight intermingling of ash gray showing on the sides of the crown; back of neck olivaceous green; feathers of back with broad black centres and edges of light buffy brown; lores and a small spot at base of gonys black; cheeks, sides of neck, and under neck ash gray merging into white on the chin; a narrow white superciliary stripe which broadens to the base of the upper mandible; a white stripe on the upper edge of cheek extending from chin to ear coverts; cheeks, ear coverts, sides of throat, fore neck, breast, and sides of body ash gray; flanks a buffy brown; belly white; under tail coverts buff; upper tail coverts dusky; under wing coverts and under side of quills ash; axillaries dusky; bastard wing, primary coverts, and quills a light brown; ash below; first primary with outer web whitish; feet yellowish with tint of greenish; eye carmine; bill dusky above, lighter below, with a tint of greenish yellow on the tip of both mandibles. Length 6.50, wing 3.60, extent of wing 11, tarsus 1.30, culmen .75, its depth at nostrils .25, mid-toe and claw 1.83. *Hab.* Guam.

GENUS **GALLINULA** BRISSON.

21. **Gallinula chloropus** Lath. **Pulatel. Gallinule.**

The Water Hen or Moor Hen, Albin, Nat. Hist. B., 1738, II., p. 66, pl. 72.
Fulica chloropus, Linn., Syst. Nar., 1766, I., p. 258.
Gallinula chloropus, Lath., Ind. Orn., II., p. 773; Steere, List of Mamm. and B. Philip., 1896, p. 258; Hartert, Nov. Zool., V., p. 62.

This bird is abundant in the marshy grounds and taro patches all over the island; it is highly prized by the natives for food. General color a bluish slate, with mantle, rump, wing coverts and upper tail coverts a beautiful olive brown; scapulars like the mantle; primary and secondary quills blackish brown; outer primary and bastard wing feathers externally edged with white; tail feathers blackish; crown and face blackish with a slight blueish tint, which fades into a lighter slaty blue on the neck and fore breast, and extends over the entire under surface of the body; posterior part of belly with a still lighter grayish tint, while in some specimens this part is almost pure white (immaturity). A few white feathers on the sides and flanks; under tail coverts white, with the feathers of the vent and the long median tail coverts black; frontal shield and two-thirds of the bill a deep lake red, anterior third a bright greenish yellow; tarsus lemon yellow; garter of rich lake red followed by a band of lemon yellow just above the knee; joint of the tarsus greenish; toes dusky with a slight tint of yellowish; iris reddish. No. 9595, an immature male, has the feathers of the back of a decided brownish cast; wings and tail dusky; top of head and back of neck brown, more or less mixed with gray on sides of head, face, and neck; chin, throat, lower third of cheeks, and the belly white; the remaining under parts a mingling of white and pale slaty blue; shield much restricted and dusky in color; upper mandible dusky; lower mandible, and tip of upper, with a slight shade of yellowish; legs and feet without the red coloring, but the front scales colored a bright lemon yellow. Quite a lot of grass and remains of insects and larvæ were found in the stomachs of these specimens. *Hab.* Europe, Africa, Asia, and many Pacific islands. Guam.

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9595	June 7	11.31	5.55	2.12	1.86	1.18	2.75	juv. ♂
9594	June 5	12.25	6.31	2.50	2.00	1.62	2.50	♀
9596	June 9	11.75	6.50	2.77	1.80	1.50	2.68	♀
9597	June 11	12 50	6.37	2.26	2.00	1.68	2.75	♀
9598	June 13	12.50	6.92	3.00	1.86	1.68	3.00	♀
9599	June 13	12.50	6.92	3.00	1.86	1.68	3.00	♂

The spread of the wings from tip to tip is about 18.50, and the depth of the bill at the base is about .37.

GENUS **FULICA** LINNÆUS.

22. **Fulica atra** Linn. **European Coot.**

General color slaty, bill and frontal shield whitish, edge of wing and edge of first quill whitish. Length 16, wing 7.70–8.80, culmen 1.70–2, tarsus 2.25–2.35, mid-toe and claw 2.85–3.15. *Hab.* Europe and Asia, ranging south to the Philippines and Pacific islands; accidental on Guam.

Order LIMICOLÆ.—Shore Birds.

a^1. Tarsus transversely scutellate, culmen longer than middle toe without claw. Family *Scolopacidæ*, Snipes, Sandpipers.

a^2. Tarsus with small hexagonal or irregular scales in front, bill shorter than tarsus, nasal openings reaching beyond the basal fourth of the bill. Family *Charadriidæ*, Plovers.

a^3. Tarsus slightly longer than culmen, lower back and rump white with a black band. Family *Aphrizidæ*, Surf Birds and Turnstones.

FAMILY **SCOLOPACIDÆ**.—SNIPES

a^1. No hind toe. Genus *Calidris*.

a^2. Hind toe present.

b^1. Culmen thickened at tip, thighs naked, tarsus not so long as mid-toe and claw. Genus *Gallinago*.

b². Culmen longer than mid-toe and claw, tip of bill not decurved, under primary coverts white, toes cleft to the base. Genus *Tringa*.

b³. Culmen longer than tarsus, lower parts white, chest streaked or spotted with dusky, tail barred with grayish or dusky. Genus *Totanus*.

b⁴. Wing 6.5 or more.

c¹. Wing about 8, bill decidedly arched or decurved. Genus *Numenius*.

c². Wing about 6, tarsus equal to the hind toe and claw, axillars grayish, no web between inner and middle toes at base, bill grooved for at least half its length. Genus *Heteractitis*.

c³. Wing 7 or more, terminal part of bill smooth and hard, culmen 3 or more, no white on wings. Genus *Limosa*.

GENUS **GALLINAGO** LEACH.

23. **Gallinago megala** Swinh. **Snipe.**

General color above blackish striped with sandy isabelline, breast and abdomen white, a red subterminal band on the tail, tail feathers 20. Length 9.5, culmen 2.3, wing 5.4, tail 2.15, tarsus 1.35. *Hab.* Eastern Siberia, wintering in the Philippines, Borneo and the Moluccas; in the Marianas during migrations.

GENUS **TRINGA** LINNÆUS.

24. **Tringa acuminata** (Horsf.). **Sharp-tailed Sandpiper.**

Legs and feet pale, wings from the carpal joint more than 4.76, the shafts of the quills for a portion of their length are white; top of head is rusty, with streakings and fleckings of dusky; fore neck and chest buff broadly streaked and splotched with dusky; rest of the lower parts white. Length 7.50–8. wing 4.90–5.50, culmen .95–1.05, tarsus 1.10–1.25. *Hab.* West coast of America, islands of the Pacific from Australia to Alaska; Guam during migrations.

GENUS **CALIDRIS** CUVIER.

25. **Calidris arenaria** Linn. **Sanderling.**

General under color white, above light rusty (to ash gray in winter), greater wing coverts broadly tipped with white. Length 7–8.50, wing 4.70–5, culmen .95–1, tarsus .95–1.05, mid-toe and claw .55–.60. *Hab.* Circumpolar; breeds on all coasts of the Arctic ocean, south in winter to Malay archipelago, and Pacific islands; Guam during migrations.

GENUS **LIMOSA** BRISSON.

26. **Limosa lapponica baueri** (Naum.). **Pacific Godwit.**

General color of the hind neck and the lower parts plain cinnamon, back and scapulars varied with blackish, whitish and rusty; in winter head, neck and lower parts whitish; the head and neck streaked, the breast and sides slightly barred with grayish brown. Length 14.60–16, wing 8.25–9.15, culmen 3.15–4.70, tarsus 2–2.45, mid-toe and claw 1.10–1.33 *Hab.* Coasts of western Asia and Alaska, south in winter to Australia; Guam during migrations.

GENUS **TOTANUS** BECHSTEIN.

a[1]. Wing under 6, central upper tail coverts white. *Totanus glareola.*

a[2]. Wing under 6, no white on rump or upper tail coverts. *Totanus hypoleucus.*

27. **Totanus hypoleucus** Linn. **Common Sandpiper.**

General color a bronzy brown, the feathers with arrow-shaped markings of black; under parts white, with dusky streaks on the throat. Length 8, culmen 1.1, wing 4.1, tail 2, tarsus .89–.96. Female smaller and not quite so well marked. *Hab.* Europe and Asia; Guam during migrations.

28. **Totanus glareola** Temm. **Wood Sandpiper.**

General color above bronze brown, with light ash bronze margins to the feathers; belly white. Length 8.5, culmen 1.15, wing 4.6, tail 1.85, tarsus 1. *Hab.* Europe, Africa, China, Burmah, Malay archipelago; Guam in migrations.

GENUS **NUMENIUS** BRISSON.

a[1]. Length about 15, bill less than 4, lower back and rump mottled with bars and spots of brown. *Numenius phæopus variegatus.*

a[2]. Length about 22, bill more than 4, tarsus more than 3. *Numenius cyanopus.*

29. **Numenius phæopus variegatus** Scop. **Oriental Whimbrel.**

Adult bird has a pure white lower back, but the immature birds are streaked with dusky; the crown is a plain brown with a pale mesial streak; lower back much paler than the mantle. Length 15, culmen 3, wing 8, tarsus 2.15. *Hab.* Asia. In migrations it is common in China, Japan, Burmah, Ceylon and Pacific islands; Guam during migrations.

30. **Numenius cyanopus** Vieill. **Australian Curlew.**

General color brown, much streaked and blotched; coloring of the rump uniform with the back. Length 21–24, bill 6.8–7.2, wing 11.9–12.5, tail 4–4.6, tarsus 3.2–3.5. *Hab.* Breeds in Siberia; winters in Australia, Borneo, Tasmania, and Malay peninsula.

GENUS **HETERACTITIS** STEJNEGER.

31. **Heteractitis brevipes** Vieill. **Asiatic Wandering Tattler.**

Heteractitis brevipes, Vieill., N. Dict. d'Hist. Nat., 1816, VI., p. 410.
Totanus polynesiæ, Peale, Zool. U. S. Exp. Exped., 1838, B. p. 237.
Totanus incanus brevipes, Seeb. Geog. Dist. of Charad., p. 361.
Totanus incanus, Wilson, Aves Hawaiienses, p. 151; Hartert, Nov. Zool., V., p. 65; Oust., II., p. 41.
Heteractitis brevipes, Grant, Cat. B. Brit. Mus., XXIV., p. 449.

Specimens of the Wandering Tattler were shot during the months of June and July. They were very scarce and wild, and consequently hard to take. Their notes and habits seemed identical with the American form. The upper coloring of the male is a uniform ashy gray; the rump and tail coverts a shade lighter gray, the latter with indications of cross markings near the tips; primary quills dusky, secondaries gray; tail feathers uniform gray; crown brown, with whitish superciliary stripe which extends to and around the base of the upper mandible; lores dusky; cheeks grayish; throat white. In specimen No. 9524 the sides, under neck and breast are grayish, without cross markings of any kind; the belly, under tail coverts, and flanks are pure white; sides grayish. In No. 9525 the under neck, breast, sides, flanks and lower belly is profusely spotted and barred with dusky gray. Length 10–10.50, wing 6–6.20, tail 2.73–2.75, tarsus 1.16–1.17, culmen 1.43–1.45, mid-toe and claw 1.16. *Hab.* From eastern Siberia and Kamchatka, through Japan and China to Malayan archipelago, Papuan Islands, Marianas and Australia.

FAMILY **CHARADRIIDÆ**.—PLOVERS.

a^1. Wings less than 8, plumage without metallic tint, head without crest. Genus *Charadrius*.
  b^1. Axillars black. *Charadrius squatarola*.
  b^2. Axillars smoky gray, or ash gray. *Charadrius fulvus*.
  b^3. Axillars white, length 7. *Charadrius mongolicus*.

GENUS **CHARADRIUS** LINN.

32. **Charadrius squatarola** (Linn.). **Black-bellied Plover.**

General color black, upper parts irregularly spotted with dusky and whitish, except on the forehead and a line which is pure white to the sides of the breast; in winter the lower parts are white.

Length 10.50–12, bill 1.10, wing 7.50, tarsus 1.95, mid-toe and claw 1.15. *Hab.* Northern parts of the northern hemisphere, south in winter to the Pacific islands.

33. **Charadrius fulvus** Gm. **Dululi. Asiatic Golden Plover.**

Charadrius fulvus, Gmelin, Syst. Nat., 1788, I., p. 687; Seebohm, Geog. Dist. of Charad., p. 99; Rothschild, Avifauna Laysan, I., p. 11; Hartert, Nov. Zool., V., 66; Oust. II., p. 46.
Charadrius dominicus fulvus, Raffl., Trans. Linn. Soc., XIII., p. 328; Ridge. Pro. U. S. Nat. Mus., 1880, p. 198.
Charadrius dominicus, Sharp, Cat. B. Brit. Mus., XXIV., p. 191.

The Asiatic Golden Plover was common, both in the inland valleys and along the sea shore, all during the summer months. Many of the specimens were fine adults, with organs in erotic state; the greater number, however, were immature birds. I was informed by a resident sportsman that these birds arrived in great flocks during the fall and spring months. A fine series was secured. Seven specimens with plumage graduating from adult to immature, but apparently full grown birds, give the following measurements:

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9517	June 9	9.50	6.25	2.42	1.75	.90	1.26	♂
9518	July 2	9.50	6.60	2.35	1.60	1.00	1.25	♂
9519	July 2	9.50	6.31	2.37	1.57	.98	1.21	♂
9520	July 2	9.50	6.11	2.31	1.59	.95	1.27	♂
9521	July 2	9.40	6.35	2.31	1.70	.95	1.27	♂
9522	July 2	9.50	6.27	2.35	1.63	.95	1.25	♂
9523	July 15	10.25	6.35	2.56	1.75	.92	1.26	♂

General color above (adult males) mottled with black, golden buff and whitish; primaries and secondaries dusky, the shafts of the primaries brown followed by white near the end and tipped with dusky; a frontal band and a distinct eyebrow of white, this white line extending down the sides of the neck to the white on the sides of the body; general under color black, with a few feathers showing buffy or white; axillaries smoky brown; bill and feet dark; tarsus a dusky gray; eye dark brown. *Hab.* (Seebohm) "Breeds on the tundras of eastern Siberia, from the valley of the Yenisei to the Pacific. It passes through Japan, South Siberia, and Mongolia on migrations, and winters in India, Burmah, China, islands of the Malay archipelago, Australia, and the islands of the Pacific, east to New Zealand, west to Heligoland."

34. **Charadrius mongolicus** Pall. **Mongolian Sand Dotterel.**

Charadrius mongolicus, Pallas, Zoogr. Rosso-Asiat., 1826, II., p. 136; Seebohm, Geog. Dist. of Charad., p. 147; Hartert, Nov. Zool., V., p. 66; Oust., II., p. 48.
Ægialitis mongolicus (Pall.), Swinhoe, Ibis, 1870, p. 360.
Ochthodromus mongolus, Sharp, Cat. B. Brit. Mus., XXIV., p. 223; Hall, Key to B. Aust., 1899, p. 82.

This bird was very scarce on Guam during the months of my stay (May and August). Only one specimen was seen, which proved to be an adult female, No. 9526. The general color above is a worn light brown with a slight trace of olive green; there is but a slight trace of the rufous color on the fore breast; under parts white; lores dusky; tarsus dark grayish; bill dark; eye dark hazel. Length 7, spread of wings 15, wing 5.06, tail 2.00, tarsus 1.25, mid-toe and claw .95, culmen .63, the terminal vault .33. *Hab.* (Seeb.) "The Mongolian Sand Plover breeds in Asia from eastern Turkestan to the valley of the Amoor, and winters on the coasts from the mouth of the Red Sea to the islands of the Malay archipelago and Australia. Guam.

FAMILY **APHRIZIDÆ**.—SURF BIRDS AND TURNSTONES.

GENUS **ARENARIA** BRISSON.

35. Arenaria interpres (Linn.). **Black Turnstone.**

General color dusky, upper parts varied with rufous or white, throat white, head chiefly white, chest black. Length 9–9.90, wing 6, culmen .80–.90. *Hab.* Cosmopolitan, Pacific islands in winter; accidental on Guam.

Order GALLINÆ.—Gallinaceous Birds.

a¹. Hind toe elevated, nostrils never hidden by feathers, tarsi partially or entirely naked. Family *Phasianidæ*.

b¹. Tail feathers 8, tarsi without spurs. Genus *Excalfactoria*.

b². Tail feathers 14–16, a comb and spurs present. Genus *Gallus*.

a². Hind toe on a level with the others, oil glands nude, upper tail coverts not reaching to the end of the tail feathers. Family *Megapodiidæ*.

c¹. No white on the basal part of the primaries, head French gray. Genus *Megapodius*.

GENUS **EXCALFACTORIA** BONAPARTE.

36. Excalfactoria sinensis (Gm.). **Bing-bing. Pigmy Quail.**

These little birds were introduced from Manila in 1894 by Captain Pedro Duarty, of the Spanish Army, and are now very generally distributed over the island. Their favorite feeding grounds seem to be the dry rice paddies and the grassy places on the hill sides. Two specimens, a male and a female, and one set of seven eggs were secured. The size of this little quail is as follows: Total length 5, wing 2.75, tail 1.00, tarsus .80, culmen .43, mid-toe and claw .78. The eggs (Fig. 1, *a*.) are of an enormous size for so small a bird, measuring 1 × .80; they are shaped like the

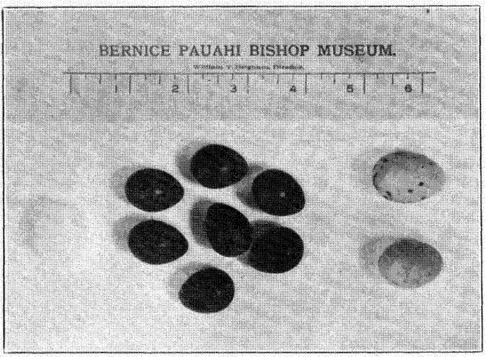

FIG. 1.
a. Excalfactoria sinensis (Gm.). *b*. Aplonis kittlitzi, F. P. H.

eggs of the common quail of the eastern United States, and are of a brownish color deeply sprinkled over the entire surface by fine deeper brown dots. *Hab*. Philippines, Palawan, Borneo, Java, Sumatra, Australia and Guam.

GENUS **GALLUS** LINN.

37. **Gallus bankiva** (Temm.). **Jungle Fowl.**

General under color black glossed with green; mantle orange; scapulars, median wing coverts and lower back a dark maroon red; comb emarginate; a wattle on each side of the throat. Length 29, wing 9.5, tail 14, tarsus 3.1. *Hab*. Marianas, Philippines, Palawan, Celebes Islands; also in India, China, Siam, Java, and Malay peninsula.

GENUS **MEGAPODIUS** QUOY & GAIMARD.

38. **Megapodius laperousi** Quoy & Gaim. **Megapode.**

Head French gray, mantle and under parts grayish black shading into a dark olive brown on the wings, bill and legs yellow, naked skin on head red. Length 9.5, wing 7, tail 2.3, tarsus 2. *Hab.* Marianas and Pelew Islands.

Order COLUMBÆ.—Pigeons.

a^{1}. Tarsus feathered for more than half its length, general color green, wings less than 5.19. Family *Treronidæ*, Fruit Pigeons.

b^{1}. Forehead and a spot at the base of the lower mandible purple-red. Genus *Ptilinopus*.

a^{2}. Tarsus not feathered more than half its length, wing more than 5.19, general color brown or gray. Family *Peristeridæ*, Ground Pigeons.

c^{1}. General color brown or olive bronze, length of tail 4 or less. Genus *Phlogœnas*.

c^{2}. General color gray, length of the tail more than 5. Genus *Turtur*.

GENUS **PTILINOPUS** ELLIOT.

39. **Ptilinopus roseicapillus** (Less.). **Totot. Rose-crowned Fruit Pigeon.**

Columba roseicapilia, Less., Tr. d'Orn., 1831, p. 472.
Columba purpurata Kittl. (nec. Gm.), Kupfertaf, 1833, Haft. III., p. 25, t. XXXIII., f. 2.
Ptilopus roseicapillus, Ost., Le Natural, 1889, p. 261; Wiglesw., Ibis, 1889, p. 584; *Id.* Aves Polynes., 1891, p. 48.
Ptilinopus roseicapillus, Hartert, Nov. Zool., 1898, V., p. 60; Salvadori, Cat. B. Brit. Mus., XII., p. 108.

The Totot, as the natives call this beautifully colored fruit pigeon, is common on the island, and its loud peculiar notes can be heard at almost any time of day from the tall trees along the roadside or in the forest, beginning in a low tone and slow, gradually increasing in volume and rapidity, and then dying away again, like *tot----tot---tot--tot-tot-tot-tot-tot--tot---tot----tot*, and like most of the birds probably gets its native name from the sound it makes. In making this sound they bend the head down so that the bill touches the lower breast, and the top of the neck has the appearance of being puffed up. One kept in a cage some time fre-

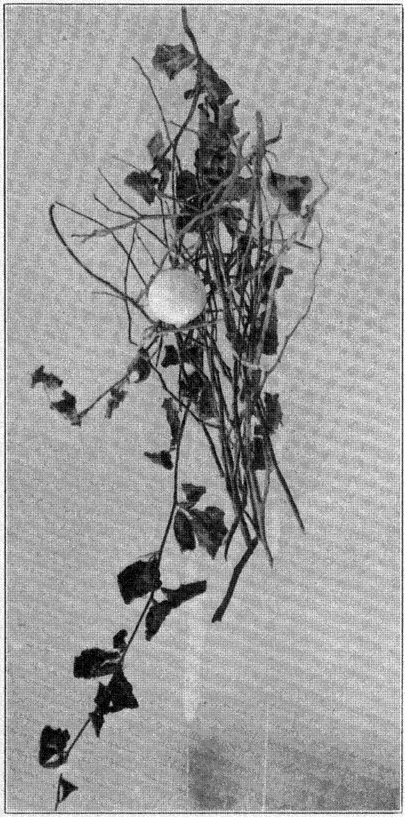

FIG. 2. PTILINOPUS ROSEICAPILLUS (LESS.).

quently made this sound at night. These birds are much hunted by the natives for food, and one would think that they would be very easily seen because of their bright coloring. Such, however, is not the case, for when among the green leaves of the breadfruit trees, which seem to be their favorite haunts, their coloring harmonizes so well with the leaves that they are very difficult to see. Their food consists of wild berries and fruits, all the stomachs containing seeds of the *Linovia trifoliata*. The general color above is a bright green; crown, forehead, and spot at the base of the lower mandible purple-red, margined behind with yellowish; primaries and secondaries green with a glossy reflection, the inner webs purplish, the secondaries margined with a slight line of yellowish; wing coverts green, the greater coverts margined with yellowish; scapulars purplish, margined with yellowish green; chin and throat a yellowish white; sides of head and neck grayish green; breast greenish, with the feathers tipped with pearly gray; a bright purple patch on the middle of lower breast, surrounded by a zone of greenish and orange; belly orange, greenish along the sides; vent and tip of feathers on thigh yellowish; under tail coverts yellowish orange; upper tail feathers green, with a broad yellowish gray distal band margined narrowly with yellow; under coloring of wings and tail gray, the tail feathers showing white markings on the inner webs near the end; under wing coverts gray with a slight mingling of green; bill a pea green; feet and tarsus a dark gray with a tint of purplish; iris gold yellow. I find no difference in the coloring of the sexes. Six specimens selected at random give the following measurements:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9488	May 29	9.00	5.00	2.94	1.00	.55	1.19	♂
9489	June 1	9.00	5.14	3.00	.96	.56	1.14	♀
9495	July 11	9.05	4.92	3.00	1.03	.50	1.06	♂
9496	July 11	9.00	4.90	3.00	1.00	.50	1.15	♂
9497	July 20	8.95	5.00	3.00	1.03	.50	1.16	♀
9498	July 20	4.00	2.90	1.00	.75	.57	1.16	fledgl.

The spread of the wings from tip to tip is about 15.25, and the depth of the bill at the nostrils is about .17. The immature, No. 9498, has no red on the head or crown; general upper coloring green with the feathers edged with yellowish; no dark spot on the breast; feathers of the belly yellowish; bill grayish; feet flesh color with a tint of pink; eye light hazel.

Two nests, each containing one egg, were found. These were crude flat structures, constructed of twigs about the size of a knitting needle, very loosely put together and placed on the top of a small branch of the *Triphasia aurantiola*, eight or ten feet from the ground, and how the egg is kept from rolling out when the wind blows is more than I can understand. (See Fig. 2.) The eggs are pure white and look like the eggs of the domestic pigeon. Their size was 1.31 × .85 and 1.12 × .80. *Hab.* Guam, Saipan, Rota.

This bird is somewhat similar to *P. ponapensis*, from Ponape, but the latter has more lilac on the crown and no red at the base of the lower mandible ; it is also lighter gray on the neck, and the band on the tail is yellowish in Ponape specimens.

GENUS **PHLOGOENAS** REICHENBACH.

40. **Phlogoenas xanthonura** (Temm.). **Poloman kanau. White-headed Pigeon.**

Columba pampusan, Quoy & Gaim., Voy. Uran. Zool., 1824, p. 121, pl. 30.
Columba xanthonura, Temm., Pl. Col. 190 (liv. 32, 1823).
Peristera erythroptera (part), Cass., U. S. Exp. Ex. Birds, 1853, p. 277.
Phlegoenas pampusan, Cat. Brit. Mus., 1893, XX., p. 602 ; Wiglesw., Aves. Polynes., p. 55.
Phlegoenas xanthonura, Hartert, Nov. Zool., 1898, V., p. 60.

These pigeons are common all over the island. Sixteen specimens were secured,—6 adult males, 1 immature male, 8 females, and 1 fledgling. The adult males have the forehead, cheeks, superciliary region, throat and breast pure white ; crown, back of neck and ear coverts a rusty rufous. In fully adult breeding birds there is a slight wash of buff on the nape, as in No. 9511 ; remainder of upper parts olive bronze ; anterior part of mantle and the wing coverts with a rich lustre of purple-violet ; primaries brown ; quills dark ; mid-tail feathers brown, the lateral one grayish black with a broad sub-terminal band of black ; belly and under tail coverts brown, with some of the feathers slightly tipped with rufous ; feet brown, with a slight pinkish tint ; bill dark ; eye dark hazel. The adult female (type of *Columba pampusan*) has no white coloring at all, the entire body being a uniform rufous brown with a distinct olive lustre on the back ; forehead, crown and nape cinnamon ; feathers of wing coverts and belly edged with rufous ; tail rufous, with a broad sub-apical black band which is not so distinct on the two central feathers ; feet brown ; eye dark hazel ; bill a brownish flesh color. The immature males have a number of dirty white feathers appearing on the breast and throat ; sides, top of head and neck deep brown, with an intermingling of a few rufous feathers ; the lesser and middle wing coverts with the splendid purple-violet coloring of the adult male, No. 9505 ; the feathers of the middle wing coverts are tipped with rufous ; bill dusky, with a slight greenish cast ; feet brown, with a pinkish tint ; eyes dark hazel.

These pigeons seem to prefer the deep jungle, from whence their deep low moan, like the sound of a man dying in great distress, comes with a wierd uncanny effect, heightened by the gloom and darkness of the unknown forest. This sound, which always seems to come from a long distance, is very misleading, and one is considerably surprised to find he is perhaps within a few feet of the bird. Their food consists chiefly of the fruit of the Lemonceti (*Triphasia aurantiola*) and a small berry, called by the natives

Tintan-china, one of the Ink-berries, a species of Privet. Both of these are found in abundance all over the island. Six typical specimens give the following measurements:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9503	June 4	11.00	6.00	4.00	1.25	.75	1.62	♂
9505	June 11	10.50	5.55	3.75	1.36	.68	1.50	juv. ♂
9506	June 13	11.00	5.95	3.80	1.50	.75	1.25	♀
9513	June 13	10.05	5.62	3.96	1.25	.71	1.25	♂
9508	June 13	9.75	5.30	3.50	1.43	.62	1.25	juv. ♀
9510	June 15	9.75	5.19	3.50	1.25	.65	1.37	♀

It will be seen by this that the female is slightly smaller than the male. *Hab.* Marianas.

GENUS **TURTUR** SELBY.

41. **Turtur dussumieri** (Temm.). **Paloman halum-tano. Pigeon.**

Columba dussumieri, Temm., Pl. Col. 188 (liv. 32, 1823), Manila.
Colombe dussumier, Quoy & Gaim., Voy. Uran. Zool., 1824, I., p. 35.
Turtur dussumieri, Salvadori, Cat. Brit. Mus. B., XXI., p. 423; Wiglesw., Aves Pol., p. 54; Hartert, Nov. Zool., V., p. 60.

These birds were probably introduced at an early date from Manila, and they are now (June, 1900) the most abundant *Columbæ* on the island. They are esteemed by the natives as an article of food, and are consequently hunted a great deal. *Hab.* N. E. Borneo, Philippines, Marianas. Three specimens were secured,—one male and two females. Their measurements were as follows:

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9499	June 8	12.00	6.60	5.60	1.00	.70	1.43	♂
9500	June 8	11.25	6.00	6.00	1.00	.70	1.37	♀
9501	June 14	12.00	6.36	5.12	1.00	.62	1.30	♂

Order RAPTORES.—Birds of Prey.

a^1. Without facial disk of radiating feathers, toes not feathered, plumage compact. Family *Falconidæ*.

a^2. With a facial disk of radiating feathers surrounding the eye, toes feathered, cere more or less hidden by bristles, plumage soft and fluffy. Family *Bubonidæ*.

FAMILY **FALCONIDÆ**.—HAWKS, FALCONS, ETC.

a^1. Culmen greater than half the length of the middle toe without claw. Genus *Astur*.

a^2. Culmen measured from margin of cere less than half the length of the middle toe without claw. Genus *Accipiter*.

GENUS **ASTUR** LACÉP.

42. Astur sharpi Oust. **Sharp's Hawk.**

One specimen of this species was brought back by the Astrolabe expedition, but it may not have been from the Marianas. I made special efforts to find this hawk, but without success. It probably is not found on Guam. *Hab.* Marianas(?).

GENUS **ACCIPITER** BRISSON.

43. Accipiter nisoides Blyth. **Variegated Hawk.**

One specimen of this species was taken on Guam by Mr. Ouston's Japanese collectors. No rufous collar, ear coverts gray, no white spot on the central tail feathers, breast rufous. Length 11, culmen .75, wing 6.6, tail 5.1, tarsus 1.9. Female is slightly larger. *Hab.* Eastern Asia, Indo-Malayan sub-region, Northern China, Papuan Islands; incidentally on Guam.

FAMILY **BUBONIDÆ.**—HORNED OWLS.

Wings more than 10, cere equal to the chord of the culmen, ear openings very large. Genus *Asio.*

GENUS **ASIO** BRISSON.

44. Asio accipitrinus (Pall.). **Short-eared Owl.**

It is very doubtful if there has ever been an owl taken on the Marianas. It is not found on Guam. (See Nov. Zool., V., p. 51.)

Order COCCYGES.—Kingfishers, Etc.

a[1]. Bill with rounded or slightly flattened culmen, third toe united with the fourth for more than half its length, the second united to the third for its basal third, bill not serrated, caeca none. Family *Alcedinidæ.*

b[1]. Tail longer than bill, with a more or less distinct groove along the sides of the culmen, bill compressed. Genus *Halcyon.*

c[1]. Head white, flanks pure white, a band of green behind the eye and around nape. *Halcyon albicilla.*

c[2]. Head cinnamon, the colorings of the under surface also cinnamon, except in the female, which has white on the under parts. *Halcyon cinnamominus.*

GENUS **HALCYON** SWAINS.

45. **Halcyon albicilla** Dumont.

General color above a bright blue; under surface, whole of head and neck white; from behind the eye above the ear coverts runs a streak of blue. Length 11, culmen 2.3, wing 4.9, tail 3.1, tarsus .07. Female similar in color. *Hab.* New Guinea, Solomon Islands, Louisiades, Saipan; not on Guam.

46. **Halcyon cinnamominus** Swains. **Sehig.**

Dacelo ruficeps, Cuv., Gal. du Mus., Less. d'Orn., 1831, p. 247.
Alcedo ruficeps, Cuv., Pucher, Rev. & Mag. Zool., 1853, p. 387. (Marianas; *gleich cinna mominu* Swains.)
Halcyon cinnamominus, Finsch., Jour. Mus. Godff., 1876, XII., p. 20; Sharp, Brit. Mus. Cat. B., XVII., p. 259.
Halcyon rufigularis, Sharp, Brit. Mus. Cat., XVII., p. 260.

These birds are very common near the native ranch houses and the villages. They are especially noticeable because of the loud and disagreeable noise which they are constantly making, both night and day. They are especially abundant near the city of Agaña, and their noisy kaa-kaa-kaa-kaa frequently aroused me from sleep at the unconventional hours of two and three o'clock in the morning. I was informed that Governor Leary was so exasperated by these disturbers of the night that he ordered a squad of native soldiers out to kill off all near the palace, but judging from the noise still to be heard the attempt was not an entire success. The birds make this noise just as they fly up, seeming to think it an essential part of the proceedings. Even if the distance to fly is only two feet it must be proclaimed by this jangling kaa-kaa, which is almost as unpleasant a sound as the braying of an ass. Sehig, as the natives call this bird, has a bad reputation as a chicken thief. I rather doubted his ability in this line until one day I actually saw him attack a brood of small chicks quite near me, and he would have undoubtedly secured one had not the mother hen rushed to the rescue. The chief food of this species seems to be, however, lizards and grasshoppers. I have seen them catch a lizard and then, flying into a tree, by a dexterous shake of their big bill hammer the victim against the limb of the tree until its life was extinct, after which they would proceed very leisurely to devour it, and then go to sleep. After eating, these birds are very loath to fly, and will allow one to approach within a step or two of them. The breadfruit tree is their favorite resting place. Six specimens were secured, three adult males and three adult females. The adult males have the mantle greenish blue; rump and upper tail coverts a slight degree lighter than the mantle; wings bluer than mantle, the quills blackish, more or less blue on the outer webs, the first primary with only a faint trace of bluish;

tail feathers blue; head, hind neck and entire under surface of body a uniform cinnamon; ear coverts are long tufts of dusky feathers with a tint of greenish blue; a dusky band extending from ear coverts entirely around the back of the head, forming a nuchal band; eye dark hazel; bill a dark horn, except posterior third of lower mandible which is light. The adult female (type of *Halcyon rufigularis*, Sharp) is similarly colored, but has only the throat, head, chest and thighs, cinnamon; the breast, belly, sides of body, under wing coverts and under tail coverts white. In some specimens there is a slight mixture of cinnamon on the upper tail coverts, and also a faint buffy tint on the sides. The cinnamon color of the females is not quite so bright as on the males. The measurements of the specimens taken were as follows:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9545	May 30	9.00	4.30	3.00	.75	1.67	1.00	♂
9546	May 30	10.00	4.60	3.24	.75	1.67	1.00	♂
9547	May 30	9.75	5.00	2.93	.67	1.58	1.70	♂
9548	May 30	10.00	5.18	3.25	.60	1.81	1.60	♀
9549	May 30	10.50	4.00	3.28	.62	1.67	1.60	♀
9550	June 4	10.00	4.00	3.00	.67	1.57	1.00	♀

The extent of the wing is about 14.50; the depth of the bill at the nostrils is about .57. *Hab.* Island of Guam.

Order MACROCHIRES.—Swifts, Goatsuckers, Etc.

a¹. Tarsi and toes naked, tail slightly forked, color dusky. Family *Cypselidæ*.

b¹. Shafts of the rectrices ordinary and without spinous points. Genus *Collocalia*, Gray.

47. Collocalia fuciphaga (Thunb.). Jajaguag. Swift.

Hirundo vanikorensis, Quoy & Gaim., Voy. Astrolabe, Zool., 1830, I., p. 206.
Collocalia fuciphaga, Cat. B. Brit. Mus., XVI., p. 499; Oust., I., p. 187; Hartert, Nov. Zool., V., p. 53.

These birds are quite common, especially over the grassy hills, where they could be constantly seen hawking about for insects. I never have seen them alight. Many caves on the island were searched in the hope of finding the nests and eggs, but I was unsuccessful, although the birds doubtless nest on the island in large numbers. The upper surface is a sooty brown with a slight gloss; the head is uniform with the coloring of the mantle, with a little deeper gloss; the wings and tail are darker; the under surface is brownish gray ; there is a small spot of grayish in front of the eye ; bill and feet dusky ; eyes dark hazel. The four specimens secured measured as follows:—

Museum No.	*Date.*	*Length*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9529	June 1	4.17	4.18	2.00	.43	.17	.31	♂
9530	June 6	4.00	4.25	2.06	.31	.17	.28	♀
9531	July 10	4.12	4.36	2.00	.42	.18	....	♀
9532	July 17	4.00	4.33	2.00	.42	.18	....	♂

The spread of the wing is about 10, and the depth of the bill at nostrils is .06. *Hab.* The islands of the Malay Archipelago, north to the Philippines, Western Himalayas to the Nilgherries, Ceylon and the Seychelles in the west, islands of Santa Cruz and Duke of York, Sumatra, Borneo and Marianas.

Order PASSERES.—Perching Birds.

a^1. Bill broadened, flat, with rectal bristles at base. Family *Muscicapidæ*, Fly-catchers.

b^1. Tail longer than wings. Genus *Rhipidura*.

b^2. Wings longer than tail, bill equal to hind toe without claw. Genus *Myiagra*.

a^2. Bill like that of a thrush, wings rounded and short—not more than 3.30, general color an olive brown. Family *Timeliidæ*, Babbling Thrushes.

c^1. Tail of 12 feathers, the outside one less than .25 shorter than the longest, a minute bastard primary. Genus *Acrocephalus*.

a^3. Bill moderate, or very slightly hooked at tip.

d^1. Nasal feathers erect or inclined backward, bill conical and elongate, hind claw stronger than claw of middle toe. Family *Sturnidæ*, Starlings.

e^1. Color black, length about 9.50, immature streaked with yellowish. Genus *Aplonis*.

d^2. Nasal feathers directed forward, bill strong and curved, wing more than 4. Family *Corvidæ*, Crows.

e^2. Black, length about 15. Genus *Corvus*.

d^3. Nasal openings in long soft grooves, tongue brush tipped. Family *Meliphagidæ*, Honey-eaters.

e^3. General color red. Genus *Myzomela*.

e^4. General color yellow.

f^1. Eye with white ring. Genus *Zosterops*.

f^2. Eye without ring. Genus *Cleptornis*.

GENUS **RHIPIDURA** VIGORS & HORSFORD.

a^1. "Bases of all the tail feathers, rump and upper tail coverts rufous, length 4.94." *Rhipidura saipanensis.*

a^2. Bases of the tail feathers, rump and upper tail coverts a bright rufous, length 5.50–6.25. *Rhipidura uraniæ.*

48. **Rhipidura saipanensis** Hart.

Mr. Hartert, in Nov. Zool., 1898, V., p. 54, describes the *Rhipidura* from the island of Saipan as a new species. I have no specimens from Saipan, but in description they are characterized as having the base of rectrices rufous; rump and upper tail coverts rufous; sides of abdomen rufous; ear coverts, line under eye, and lores black; all of which is most certainly true of the *R. uraniæ*, which I now have before me. These were taken on the island of Guam during the months of June, July and August, 1900. The measurement of *R. saipanensis* is given as (male): "Length 151 mm., wing 69 mm., tail 80 mm., bill 8 mm., tarsus 19 mm. *Hab.* Island of Saipan, Marianas."

49. **Rhipidura uraniæ** Oust. **Chirita. Fan-tailed Fly-catcher.**

Rhipidura uraniæ, Oustalet, Bul. Soc. Philom de Paris, V., p. 75; Wiglesw., Aves Polynes., 1891, p. 20.

This is one of the most interesting little birds on the island, and they were so abundant that it was quite unusual to walk half a mile along the road without seeing at least a pair of them, or hearing their sweet little song which consists of about six low musical notes. It also makes a peculiar charring sound to warn people away from its nest. The following account was written in the field as I watched the bird and is copied from my field notes of June 28:

"Seated in the brush waiting to hear the warble of Ga-kalison, 'The Dweller among the Reeds' (*A. lucinia*), I have a good opportunity to watch and compare the notes and habits of the two Guam fly-catchers, *R. uraniæ* and *M. freycineti*, which are now feeding within six feet of me. *Uraniæ* is extremely active, and as compared to it the movements of *Freycineti* are very slow and clumsy. *Uraniæ* has the most astonishing way of whirling around and alighting just the other end on from what one expects. In this instance it was as polite as a Spaniard, and always faced towards me, spreading its beautiful fan-like tail and making a low chirping note. Not so the *Freycineti*, who looked me over critically, elevated his head crest, and giving his tail an odd little twerk, proceeded to hop deliberately up the limb like a sap-sucker, busy at work looking for breakfast. However, I saw him catch a few insects on the wing, his wide curious looking bill closing with a loud snap. *Uraniæ* caught most of his breakfast on the wing, darting about the bushes in a way that made me suspect he was showing off, and putting the more clumsy *Freycineti* in as bad a light as possible. I was not fooled, however, for with such a fine rudder as his tail makes it is but natural that he should be able to change his course rapidly. Sometimes he seemed to whirl about merely for the fun of whirling.''

Three adult males, three adult females, a young bird about ready to fly, and a nest were taken. The adults measured as follows:

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9470	May 30	6.25	2.68	2.81	.81	.43	.50	♂
9471	May 30	6.00	2.81	3.00	.83	.43	.53	♂
9472	June 1	5.50	2.50	2.75	.80	.41	.50	♀
9473	June 6	5.90	2.62	2.82	.84	.42	.56	♂
9474	July 6	5.50	2.65	2.75	.80	.39	.56	♀
9475	July 9	5.50	2.50	2.75	.80	.45	.56	♀

The spread of the wings is about 7.75, the depth of the bill at nostrils is about .12. The adult birds on the upper surface are an ochraceous brown, becoming a bright rufous on the rump; upper tail coverts and bases of rectrices are a bright rufous; the tail feathers, which are exceptionally wide and long for such a small bird, are a shining dusky brown, almost black; primaries and secondaries are a soft brown, slightly darker than the mantle—the outer webs are slightly fringed with red; under surface of wing a lighter brown. No. 9472 has the greater and middle wing coverts tipped with rufous, thus forming two rufous bands on the wings; but in the other specimens these bands are very indistinct, or entirely worn off; forehead a bright rufous, slightly dusky around base of upper mandible; the bright rufous of the forehead merging into the ochraceous brown on the crown; the feathers of the crown with dusky centres. In my series the females do not show the dusky centres to these crown feathers, although the bases of the feathers are dusky as in the male. I doubt, however, if this difference would hold good in a large series, and apart from this slight point I find the sexes identical. Throat and under neck black, the feathers assuming white tips on the breast; hind breast and belly white, with rufous tint; sides, flanks, thighs and under tail coverts rufous; chin grayish white, with a whitish irregular line extending from the base of the gonys down the sides of the throat; otherwise, cheeks, lores and ear coverts dusky; eye dark hazel; feet dark brown; bill dusky, except on the gonys, which are grayish. The nestling secured has the upper surface thickly covered with filmy feathers of a soft rufous brown; under parts grayish with rufous tint. *Hab.* Island of Guam.

The nest is very interesting, neatly and very compactly woven in and out with fine vegetable fibre; the outside is covered with a fine padding of material resembling the paper fibre made by wasps. The nest has a very curious projection of fibres extending from the bottom. This pretty little structure is usually built in the Mapuna tree, where a number of branches converge some ten or twenty feet from the ground. Inside the nest measures 1.53×1.50, while its depth is .85; outside it measures 1.83×1.85, with a depth of 2.50. (Fig. 3.)

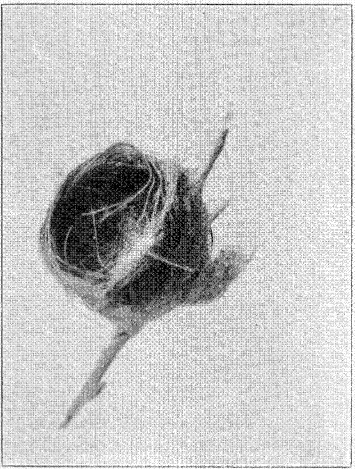

FIG. 3. RHIPIDURA URANIÆ, OUST.

GENUS **MYIAGRA** VIGORS & HORSFIELD.

50. **Myiagra freycineti** Oust. **Chigunguan. De Freycinet's Fly-catcher.**

Myiagra freycineti, Oust., Bul. Soc. Philom., 1881 (7), V., p. 73; *Id.*, Naturaliste, 1889, p. 260; Wiglesw., Aves Polynes., p. 24; Hartert, On the Birds of the Mariana Islands, Nov. Zool., V., p. 54.

The little De Freycinet's Fly-catcher is common in all parts of the island. Upon first hearing the notes of this bird I thought surely a Bush-tit, by some strange accident, had arrived on the island, the clear-whistled call of Peter-Peter-Peter seemed so unmistakable. Sometimes he varies this call by whistling three Here-Here-Here, followed by the first call. They have a habit of erecting the beautiful metallic-blue feathers of the head as a crest when they are alarmed. The general color above is a blue-purple, with a bluish sheen, head with a deeper, more metallic reflection of bluish, this color extending over cheeks, ear coverts, nape and sides of neck, meeting the white under coloring of the chin and throat in a sharp line from gape to shoulders ; a slight tint of buffy on the lower throat and fore breast ; remainder of under parts white ; primaries, secondaries, and tail feathers gray, with a bluish tint, lighter below ; upper wing coverts and upper tail coverts uniform with coloring of the mantle ; all the tail feathers minutely tipped with white (this marking is worn off in some of the specimens before me); bill dark blue ; feet and tarsus dark, with a bluish cast ; eyes dark hazel ; thighs bluish gray ; flanks and sides of body bluish gray, with the feathers tipped with white. So far as shown by my series of ten specimens the adult males and females are exactly alike, with a possible exception of a little more of the rufous coloring on the throat and fore breast of the female. In No. 9484, an adult male, this coloring is confined to a faint trace of buffy on the lower throat and fore breast, while in No. 9486, a breeding female, the coloring of the fore breast and throat is a bright rufous as in the immature of both sexes. No. 9485, a male with the testes fully developed and erotic, has the usual purple-blue upper coloring of the adult males, while the entire throat, sides of neck and breast are a bright rufous ; there is also a slight mixture of rufous among the white feathers of the abdomen. Thus the specimen is a typical adult above, and immature below. Six specimens, selected at random, give the following measurements:—

Museum No.	*Date.*	*Length*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9478	May 29	5.50	2.49	2.31	.81	.55	.51	im. ♂
9482	June 9	5.25	2.75	2.25	.75	.56	.55	♀
9483	June 26	5.50	2.68	2.31	.75	.55	.60	♀
9484	June 26	5.50	2.81	2.37	.74	.52	.62	♂
9485	June 26	5.65	2.68	2.37	.75	.56	.60	♂ (Note)
9486	July 20	5.70	2.75	2.36	.75	.56	.55	♀

The spread of the wings is about 8.50, while the depth of the bill at the nostrils is .15.

The immature are easily distinguished by the ochraceous brown coloring of the mantle, and by the greater extent of the bright rufous of the under parts, which with the exception of a small white space on the middle of the belly and the white under tail coverts is entirely rufous, brightest on the sides of the fore breast, paler on the chin and sides ; there is a slight rufous coloring on the forehead and on the upper tail coverts. The color of the crown is not such a bright metallic blue as in the adult ; the wing and tail feathers are a brown on the upper surface, lighter below ; the edges of the webs are more or less rufous or buffy, according to the age of the specimen; wing coverts brown, more or less edged with rufous; bill and feet dark, with bluish cast.

The nest and egg of this species were secured for me by a Chamorro lad. This particular nest is quite interesting from the fact it has a ring of wax, from the breadfruit tree, around the top, by which means the boy had endeavored to take the old bird. The inside measurements are 1.35×1.75 and .75 in depth; outside 2×2 and depth 1.75. (Fig. 4.) It contained two eggs, brownish cream in color, zoned near the larger end with cinereous spots and small irregular blotches; size .70×.50. *Hab.* Guam.

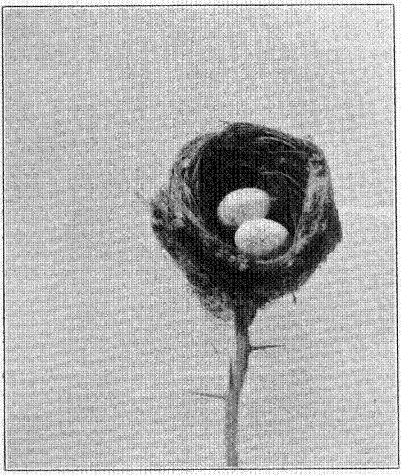

FIG. 4. MYIAGRA FREYCINETI, OUST.

GENUS **ACROCEPHALUS** NAUMANN.

a^{1}. Tail feathers without dusky cross bars, upper surface uniform brown. *Acrocephalus syrinx.*

a^{2}. Tail feathers with dusky cross bars, upper coloring olive brown. *Acrocephalus lucinia.*

51. **Acrocephalus syrinx** Kittl.

Mr. March found this species on Pagan Island, where it was probably accidental. General color above uniform ruddy brown, under surface yellowish white. Length 6.8, wing 3, tail 2.50, culmen .95–1, tarsus 1.05. *Hab.* Isle of Ponape, Carolines.

52. **Acrocephalus luscinia** (Quoy & Gaim.). **Ga-kaliso. Reed Warbler.**

Thryothorus luscinus, Quoy & Gaim., Voy. Astrolabe, 1830, I., p. 202.
Acrocephalus mariannæ, Trist., Ibis, 1883, p. 45.
Tatare luscinia, Oust., Nouv. Arch. Mus. Hist. Nat., Ser. III., Vol. VIII., p. 209.
Acrocephalus luscinia, Hartert, Nov. Zool., V., p. 57.

This bird is now quite scarce, and I predict will soon become extinct on the island of Guam. It lives exclusively among the reedy swamps, and these swamps are now being drained to make room for the Chinamen's rice paddies. Ga-kaliso, "The Dweller Among the Reeds," as this name signifies, is the most beautiful singer in all the islands. Early in the morning usually, from among the tall reeds his liquid sweet song can be heard, the notes rising and falling in happy cadence, reminding one very much of the Mocking Bird of the southern United States. These birds are very hard to distinguish in the field as they are so nearly the color of the reeds, the only way to locate them being by their melodious voices. This made the shooting of them a hard task, for to kill a bird with so sweet a voice made one feel as if he were committing a great crime. Four specimens were taken. Their stomachs contained the remains of a great many insects and larvæ. I frequently watched them feeding among the reeds. Three of these birds were males, and one female. Their measurements are as follows:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9541	June 1	8.50	3.23	3.00	1.19	1.25	1.00	♂
9542	June 26	8.12	3.37	3.00	1.20	1.25	1.05	♂
9543	July 9	8.50	3.30	2.62	1.15	1.18	1.06	♀
9544	July 9	8.20	3.18	2.68	1.18	1.18	1.03	♂

The spread of the wings is about 10.25, the depth of the bill at the nostrils is about .18. The general coloring above is a uniform olive brown, with a slight rufous tint; the primaries are a darker brown than the mantle. In No. 9542, an adult male in fine breeding plumage, the tail being darker than the mantle; while in the other specimens it is not. The tail and wing feathers, if held in a certain light, show slight cross bands; rump more or less yellowish, much brighter in the females and young males; a yellow superciliary line and lores; the entire under surface is yellowish; thighs rufous; sides of body and flanks rufous and gray; bill brown above, yellowish below; feet and tarsus brownish gray; eye dark hazel. The females and the young are colored almost alike and are characterized by the more rufous coloring in general; the rufous outer webs to the primaries and the very dark color of the inner secondary ; this latter character much more distinct in the female than in the young males ; the feathers of the thighs are also much brighter rufous in the females. The general under coloring of the feathers in this species is a dark gray, so that the outer coloring of the feathers depends largely upon how much of the brownish or yellowish tip is worn off. This is well illustrated by No. 9541, an old male with the plumage so worn as to give the bird the appearance of being gray, with rufous tint. *Hab.* Guam, Saipan.

53. **Aplonis kittlitzi** F. & Har. **Sali. Starling.**

Calornis kittlitzi, Finsch. & Hartl., Fauna Central Polyn., 1867, p. 109.
Aplonis kittlitzi, Cat. B. Brit. Mus., XIII., p. 136.

This bird is common on the island of Guam. In color and actions they very much resemble the blackbird of the eastern United States. They are noisy and quarrelsome, especially when there are any of the young birds about. Their food seems to consist chiefly of the fruit of the wild papaya. They build their nests in the hollow of a tree, usually choosing the dead trunk of a coconut for this purpose, and laying four, sometimes three eggs. Fourteen specimens of this species were taken. The immature bird, with its streaked breast, might be easily mistaken for a distinct species. The adult bird, both the male and female, is a uniform black all over the body, with a slight greenish sheen to the feathers ; bill, feet and tarsus black ; the shafts of the wing feathers and the rectrices are black on the upper surface, white on the sides, and brownish below ; this is especially noticeable on the tail feathers and the secondary wing feathers ; under surface of wings and tail dusky, but not quite so dark as the body; eyes golden yellow. Length 9.25–9.75, wing 4.56–5.00, tail 3.17–3.60, tarsus 1.25–1.37, culmen .93–.87, mid-toe and claw 1.19–1.20 *Hab.* Guam.

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9552	May 24	9.50	5.00	3.37	1.37	.93	1.25	♂
9553	May 24	9.00	4.56	3.60	1.25	.93	1.19	♀
9554	May 30	9.75	5.00	3.31	1.27	.81	1.19	♂
9555	May 30	9.50	4.67	3.17	1.30	.87	1.20	♀
9556	May 30	9.25	4.62	3.25	1.25	.87	1.14	♀
9557	May 30	9.50	4.50	2.85	1.17	.87	1.17	juv. ♀
9558	July 3	8.50	4.60	2.50	1.17	.85	1.26	juv. ♂
9559	July 11	9.50	4.75	3.25	1.25	.86	1.30	juv. ♂
9560	July 11	9.00	4.62	2.63	1.12	.86	1.30	juv. ♀
9561	July 11	9.00	4.50	3.00	1.25	.86	1.10	juv. ♀

The immature of this bird has the upper surface dusky, but not so dark as in the adult ; there is also a greenish sheen to the feathers on the upper surface ; the upper sides of the rump have more or less of a mingling of bright buffy ; the entire under surface has a streaked appearance, caused by the feathers having dusky greenish centres, with margins of buffy white ; this streaking is very fine on the chin and throat, broader on the breast and belly. Still younger specimens have less of buffy on the breast and throat ; bill and feet dusky ; eye yellow. No. 9562, a big nestling, almost ready for flight, has the upper surface black without the greenish sheen; the feathers of the throat are dusky without the buff coloring; the breast is a dirty buff and dusky; the belly is chiefly a dirty buff; bill dark, with a little lighter shade on the lower mandible; feet, wings and tail dark; eyes brownish. No. 9563, which is just assuming the first plumage, has fine black feathers emerging from their sheaths, the back has acquired a fair degree of plumage, but the breast and belly are still bare, with a fringe of dirty buffy feathers along the sides. When first hatched the young are entirely naked. The eggs (Fig. 1, *b*.) are pale green, with brown irregular spots about .15 in diameter scattered sparsely over the entire egg, being most abundant on the larger end. These eggs measured 1.27–1.15 × .95–.85. *Hab.* Marianas.

54. **Corvus kubaryi** Rchw. **Aga. Kubary's Crow.**

Corvus solitarius, Kittl., Reise, 1858, II., p. 143.
Corone philippina, Wiglesw., Aves Polynes., p. 46.
Corvus kubaryi, Rchw., Journ. f. Orn., 1885, p. 110; Hartert, Nov. Zool., V., p. 59.

This species is common in the jungles, where they soon attract attention by their noise. They are not at all wild, so I was able to approach quite near, and observe them carefully. I did not discover any new tricks—they pulled up the newly planted corn of the native in the same old way and with apparent satisfaction. They have the reputation of plundering the nests of the smaller birds in order to eat the eggs and young, and they do not seem to sound the same straightforward Caw, Caw of our American crow, for they have a sort of Polynesian twist to their tongue which makes them very hard to understand, and sounds like Qu a á Qu a á. Five specimens were secured, but owing to an accident four of them were destroyed. The remaining specimen, No. 9487, an adult female, is a deep black all over, including bill, feet and tarsus. There is a fine bluish black sheen or gloss to the feathers of the mantle, wings and tail; head a shiny black without a noticeable blue gloss; under parts a dead black color; the under color of the feathers all over the body is white or light gray; so if the outer half or two-thirds of the feathers were worn off we would have a white crow. Length 15.00, spread of wings 26.00, wing 9.50, tail 6.12, tarsus 2.00, culmen 1.80, mid-toe and claw 2. Eye dark hazel. *Hab.* Guam.

GENUS **MYZOMELA** FINSCH.

55. **Myzomela rubratra** (Less.). **Egigi. Red Honey-eater.**

Cinnyris rubrater, Less., Voy. Coq. Zool., 1826, p. 678.
Myzomela rubratra, Finsch, Journ. Godeffroy Mus., XII., p. 26; Oust., I., p. 197; Hartert, Nov. Zool., V., p. 55; *Id.*, VI., p. 2; Gadow, Cat. B. Brit. Mus., IX., p. 129.

The beautiful little red and black Egigi, as the natives call this Honey-eater, is probably the most abundant bird on Guam. They are quite fearless and are frequently to be seen in the gardens of the villages, the tall coconut palms being, however, their favor-

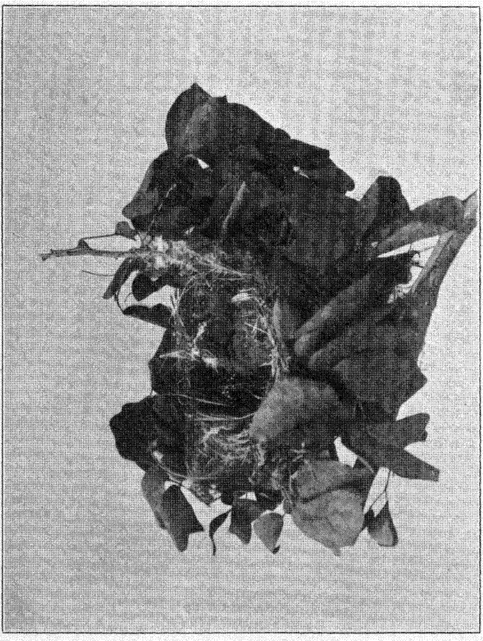

FIG. 5. MYZOMELA RUBRATRA (LESS.).

ite resorts, where they can always be seen feeding among the blossoms, doubtless attracted by the insects as well as by the honey and pollen. Their stomachs were filled with insects, many also containing traces of the coconut honey and pollen. Their size, color and actions remind one very much of the Apapane (*Himatione sanguinea*) of Hawaii. They have a sweet little song of some eight or ten notes, usually to be heard about sunrise. A series of twenty-one specimens was secured, also a number of nests and eggs. The adult female of this bird is well described by Mr. Hartert in Nov. Zool., V., p. 55, but in *Id.*, VI., he makes the statement, "The adult female differs from the male only in the smaller size," which is probably an error, as No. 9551 (Bishop Museum), a sexually adult female, as shown by the organs (See carcass No. 1502), is much lighter in color, as well as smaller in size. However, they may breed before they are fully adult. The juvenile males are usually darker than the adult females. Six specimens selected at random give the following measurements:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9451	May 24	5.00	2.50	1.68	.70	.64	.62	♀
9459	May 28	5.50	2.75	2.00	.80	.64	.70	im. ♂
9456	June 5	5.75	2.90	2.12	.84	.68	.70	♂
9457	June 7	5.50	2.88	2.06	.86	.68	.75	♂
9461	June 27	5.50	2.75	2.00	.81	.68	.70	im. ♂
9467	July 19	5.00	2.75	1.80	.78	.62	.70	♀

The adult male has the head, neck, breast, back, rump, upper tail coverts, sides and the anterior part of the belly scarlet; wings, wing coverts, tail, under tail coverts, lower belly, flanks, thighs, shoulders and under wing coverts blackish brown; lores dusky. The under coloring of the feathers is dark gray, almost black where it meets the scarlet outer tip of the feather; feet and tarsus dark; eye dark hazel. The sexually adult female has the shoulders, wings, tail, belly, sides and thighs olive brown. The scarlet coloring on the remainder of the body, head and neck is not so bright or so thick as in the adult male. They are smaller in size than the adult males. The immature males are very much like the females, but are usually a little darker in color and larger in size. The young, Nos. 9466 and 9467, are olive brown above, yellowish on under parts, washed with red on the sides of the fore breast and back; bill dark, yellowish on the base of lower mandible; feet and iris dark.

The nests were neat little cup-like structures of small rootlets, fibre of plants, and wild cotton. (Fig. 5.) The internal size, 2×1.95 and 1.25 deep; external, 2×3 and 2 deep. They were usually placed among the outer branches of the wild orange, or Kamancheti trees, eight to fifteen feet from the ground. There are usually two eggs in each nest. These eggs are white, marked with brownish dots and splotches which are especially thick on the larger end of the egg. Size .75×.57. *Hab.* Caroline Islands, Pelew and Marianas Islands.

GENUS **ZOSTEROPS** VIGORS & HORSFIELD.

a^1. General color above a dull yellowish olive, length 3.8. *Zosterops semperi.*

a^2. General color above olive green, length 4.25. *Zosterops conspicillata.*

56. **Zosterops semperi** Hartl. & Finsch. **Zosterops.**

General color above dull yellowish olive, scarcely brighter on the rump and upper tail coverts; crown like the back; in front of eye a dusky spot, and below the eye a line of dusky. Length 3.8, wing 2.2, culmen .45, tail 1.33, tarsus .7. *Hab.* Pelew Islands, east and central Carolines. Rota, according to Oustalet.

57. **Zosterops conspicillata** Gray. **Nossac.**

Dicæum conspicillatum, Kittl., Kupf. Voy., 1832, Pl. 19, Fig. 1.
Zosterops conspicillata, Gray, Gen. B. I., 1848, p. 198; Gray, Cat. B. Trop. Isl. Pacific O., 1859, p. 16; Gadow, Cat. B. Brit. Mus., 1884, IX., p. 183.

The little Nossacs are one of the common species of birds on Guam. They seem to be of a social nature and are usually seen in flocks of from ten to twenty. Their favorite feeding grounds seem to be the small Lemonceti bushes (*Linovia trifoliata*) that grow by the roadside, and in fact in the waste places all over the island. They hop about on the branches, first on one side and then on the other, keenly on the lookout for insects, which form the principal part of their food. In habits and flight they remind one very much of the goldfinch, but their note, sounded usually as they fly, is something like that of the English sparrow, but not so loud or unpleasant. Twelve specimens were taken, all but one of which were females. One nestling and three nests and eggs were secured. The measurements of half the specimens, selected at random, are given below:—

Museum No.	*Date.*	*Length.*	*Wing.*	*Tail.*	*Tarsus.*	*Culmen.*	*Mid-toe and c.*	*Sex.*
9566	May 24	4.50	2.19	1.52	.81	.44	.62	♀
9571	June 7	4.25	2.16	1.56	.80	.47	.58	♀
9570	June 1	4.25	2.30	1.50	.98	.47	.58	♂
9574	June 28	4.21	2.12	1.50	.78	.48	.59	♀
9575	June 19	4.25	2.15	1.50	.80	.44	.62	♀
9576	July 21	3.00	1.50	.56	.80	.35	.62	juv.—

The spread of wing is about 6.75, and the depth of the bill at nostrils is about .13. The general color above is olive green varying to dull grayish olive, as in No. 9567; eyes with a ring of white, bordered below by a narrow dusky line which merges into the brownish gray of the hind cheeks and ear coverts; there is also a line of white extending from this eye ring to the base and around the upper mandible; throat and fore neck yellowish white, becoming a brighter yellowish on the breast and belly; hind cheeks, ear coverts and sides of neck grayish, with a slight shade of olive

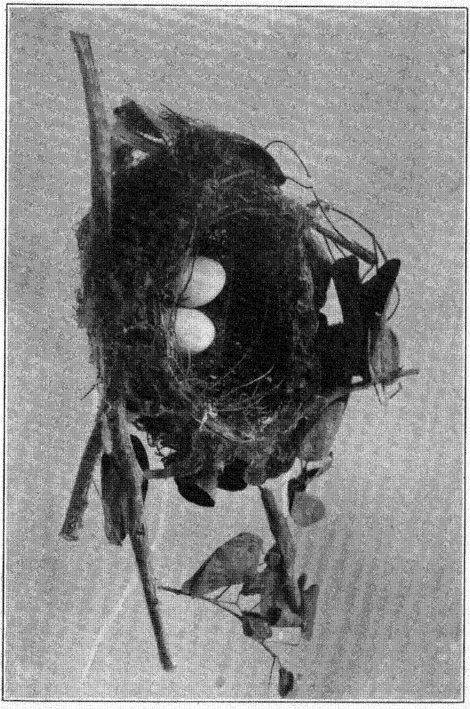

FIG. 6. ZOSTEROPS CONSPICILLATA, GRAY.

green; sides of body yellowish, with a tint of olive green; under tail coverts ranging from bright yellow to buffy; wing coverts uniform with the coloring of the mantle; under wing coverts and edge of inner webs of secondaries white; primaries brown, with the edge of outer webs olive green, except in the first primary, which is a dark brown; tail feathers olive green above, grayish below; upper tail coverts a shade brighter olive green than the mantle. The under color of the feathers all over the body is gray, so the shade of coloring on the bird depends largely upon how much of the outer tips of the feathers is worn off; bill is dusky above, light below; eye a light hazel; feet are grayish with a very slight tint of greenish. Length 4.21–4.50, wing 2.12–2.30, tail 1.50–1.56, tarsus .78–.81, culmen .44–.48, mid-toe and claw .58–.62, the depth of the bill at nostrils is about .12, and the spread of wings is about 6.50. The immature, No. 9576, just able to fly, with beak still soft, and total length of body but three inches, has the coloring uniform with the adult. The bill, however, is yellowish, and the feet and tarsi are a raw umber tint, the eyes are light hazel. The coloring of the belly is even a shade brighter yellow than in the adult. The nestlings, not yet able to fly, show the olive green coloring on the back, and buffy on the under parts; quills bluish; bill and feet yellowish.

The nests are beautiful little structures, usually built in the Ingadulus tree and well hidden among the leaves. Its size internally is 1.90×1.65 and 1 in depth, while externally it is 2.95×2.19 and 1.75 in depth. It is constructed of fine fibres and grass, the outside being covered with green moss, which renders it almost indistinguishable from below. The nest is usually placed far out where several branches come together some distance from the ground. The eggs (Fig. 6), of which there are usually two in each nest, are white with a slight tint of blue, and shaped like the eggs of a robin, measuring about .63×.50. *Hab.* Guam.

GENUS **CLEPTORNIS** OUSTALET.

58. **Cleptornis marchei** Oust. **Yellow Honey-eater.**

General color a deep golden yellow; back, rump, wings and tail olive yellow. Length of wing, as given by Hartert (Nov. Zool., V., p. 56), 76–80 mm.; bill ochraceous; iris burnt umber; feet and legs orange ochraceous. *Hab.* Island of Saipan, Marianas.

PART II.—FISHES.

FISH forms a very important part of the food of the people of Guam. There are no fish markets, however, the entire catch being divided up among those who take part in the fishing. The natives have quite a large number of pens, traps and nets. Several large seines of moderate mesh were seen in use. But the favorite way of fishing seemed to be with the small circular net, which is thrown by the fisherman as he walks along the beach.

It is recorded[1] that in former times "the natives caught and dried great quantities of fish," a grand fishing fiesta being held at certain seasons of the year. The method employed on these occasions being the poisoning of the fishes by using the juice of a native tree (*Barringtonia speciosa*). The Spanish authorities, however, finding that this was depleting the waters, by killing young as well as old, abolished this method in 1894. When the Americans took possession the law was considered obsolete. By chance I was present at the first of these fishing fiestas that had taken place for seven years. Fully seven hundred people took part in the fishing. An immense deep pool, several hundred feet across, a short distance inside the reef, was surrounded by a line of seines. At low tide about one barrel of this poisonous juice was poured into the pool. The effect was almost instantaneous; hundreds of fishes came gasping and struggling to the top of the water where they were captured and killed by the natives. No ill effect seemed to follow the eating of these poisoned fish. Thousands of small fishes were killed, and it is to be hoped our Government will put a stop to this wholesale destruction of fishes.

In the arrangement and measurement of species in the following paper I have followed Jordan & Evermann, in their work on "The Fishes of North and Middle America." I wish to express my obligations to Prof. Wm. T. Brigham, Director of the Bernice Pauahi Bishop Museum, for many valuable suggestions and kindly assistance. Many thanks are also due Dr. David Starr Jordan for looking over and supplying corrections to my MS.

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[1] Government Archives, Guam.

FAMILY **OPHICHTHYDIDÆ**.—SNAKE EELS.

GENUS **OPHICTHUS** THUNBERG & AHL.

43. **Ophicthus colubrinus** (Ahl).

Head 9 into distance from snout to vent; cleft of mouth of median width; lips fringed. Teeth in jaws and on vomer obtuse, with rounded crowns, in 2 rows; dorsal fin commencing in front of gill openings; pectorals rudimentary. Color in spirits: Grayish, with about 35 brownish rings over back and sides; the older specimens have round spots in the interspaces between the rings, or the rings may become more or less broken up into roundish spots. Two specimens 6-13 inches. Guam, June 2, 1900. *Hab.* Red Sea, Andaman to Malay Archipelago, Marianas.

FAMILY **MURÆNIDÆ**.—MORAYS.

GENUS **MURÆNA** (ARTEDI) LINNÆUS.

44. **Muræna nigra** Day.

Head about 4.50 into the distance from tip of snout to anal opening. Body elongate; the trunk and tail ot about equal length; Teeth biserial; mandible with about 20 teeth on each side; dorsal and anal moderately developed. Color in spirits: Uniform black, no light edge to fins. One specimen in poor condition. Length 8.50 inches. Guam, July 14, 1900. *Hab.* Andamans, Western Pacific, Marianas.

45. **Muræna tile** Ham.

Young: Head about 6 times from tip of snout to anal opening; the tail and trunk of about equal length. Body elongate. Teeth pointed; eye 2 into snout. Color in spirits: Brownish yellow, slightly lighter below. Two specimens. Length about 4 inches. Guam, June 2, 1900. *Hab.* Seas of Bengal to Malay Archipelago, Marianas.

GENUS **ECHIDNA** FORSTER.

46-48. **Echidna uniformis** sp. nov.

Head, from gill openings to tip of snout, 3.20 into length anterior of vent; snout 5.20 into head. Body elongate, cylindrical; branchial openings small; tail much longer than trunk; nostrils lateral. Teeth blunt, in double rows in jaws and on the palate; dorsal beginning about the length of head posterior of the gill openings; the anal beginning just posterior of vent. Color in life: A uniform yellowish white, with a slight tint of pea green. Specimens fade but little in spirits. Three specimens. Length 6–8 inches. Guam, June 2, 1900. *Hab.* Guam. No. 47, B. P. B. M., is the type of species.

FAMILY **ELOPIDÆ.**—TARPONS.

GENUS **MEGALOPS** LACÉPÈDE.

49. **Megalops cyprinoides** (Brouss).

Head 3.66; depth 4.50; eye 3; interorbital 5; maxillary 1.66, equal in length to mandibles; D. II 18; A. II 22; P. 15; scales 5-35-5, maxillary extending to posterior of eye; branchiostegals 25; tubes of lateral line branched. Body oblong and compressed; mouth oblique, lower jaw prominent; a thin plate of bone attached to symphysis of the mandible of lower jaw and extending back between rami. Teeth villiform in jaws, on tongue, vomer, palatine and pterygoid bones. Fins: One dorsal fin with the posterior ray greatly elongate—greater than length of head; the dorsal situated above the ventrals, which are abdominal; base of dorsal 1.50 into base of anal; caudal well forked; pectorals very low, their length 1.33 into head. Color in spirits: Silvery, darker above, with slight wash of bluish green; margins of fins more or less dusky. One specimen. Length 8 inches. Guam, July 14, 1900. *Hab.* China, Polynesia, Seas of India, Ceylon, Marianas.

FAMILY **SYNODONTIDÆ.**—LIZARD-FISHES.

GENUS **SYNODUS** (GRONOW) BLOCH & SCHNEIDER.

50. **Synodus variegatus** (Quoy & Gaim.)

Head 3.50; depth 5.50; eye 7; interorbital about equal to eye; mandible 1.33 into head; snout 4; D. 12; A. 9; scales about 65 in lateral line. A small adipose fin without rays. Body subcylindrical, slightly elongate; interorbital space concave; gill openings very wide. Teeth sharp, directed back, numerous in jaws, tongue, palatine—those on palatine in a single row. Fins: Caudal, forked; dorsal fin slightly longer than high; tip of ventrals on a line with posterior base of dorsal; pectorals very short, 2.50 into head; the series of scales on the tail are not keeled. Color in spirits: Grayish above, white below; about 10 wide greenish bands over the back down on sides to below the axis; vertical fins with brown dots forming streaks; head more or less mottled with greenish, with 3 or 4 greenish splotches along sides of jaws, and 3 spots on under rami of jaws. One specimen. Length 5 inches. Guam, July 13, 1900. *Hab.* Indian and Pacific oceans, Marianas.

FAMILY **ESOCIDÆ**.—NEEDLE-FISHES.

GENUS **TYLOSURUS** COCCO.

51. **Tylosurus annulatus** Cuv. & Val. **Gar-fishes.**

Head 2.50; D. 23; A. 21; V. 6; eye 2 into postorbital length of head. Teeth rather strong, none on the vomer; scales thin and small; lateral line forming a keel along the free portion of tail. Color in spirits: Back and upper part of head green, with slight wash of steel blue; sides and belly silvery white; dorsal dusky; caudal with a dusky centre; remaining fins whitish; pectorals with an indistinct blotch at base. One specimen. Length 14 inches. Guam, July 14, 1900. *Hab.* Red Sea, Seas of India, Malay Archipelago, China, Marianas, North Australia.

FAMILY **HEMIRAMPHIDÆ**.—BALAOS.

GENUS **HEMIRAMPHUS** CUVIER.

52. **Hemiramphus limbatus** Cuv. & Val.

Head 3 or a little less; depth 3.50 into head; eye 4.50; snout 3.50; D. 14; A. 12; scales 54. Teeth minute and in several rows in both jaws; upper jaw short, wider than long. Fins: Caudal, lobed; the lower lobe the longest; dorsal beginning slightly in advance of anal; ventrals equal to orbit; pectorals 3 into head. Color in spirits: Silvery, bluish above; a distinct silvery band which posteriorly is equal to one scale; tip of dorsal and anal dusky. Five specimens. Length 7–10 inches. Guam, June 14, 1900. *Hab.* Seas of India, China, Western Pacific, Marianas.

FAMILY **FISTULARIIDÆ**.—CORNET-FISHES.

GENUS **FISTULARIA** LINNÆUS.

53-55. **Fistularia depressa** Linn. **Trumpet-fish. Bagag.**

Head 2.66; depth 3.20; eye 11; interorbital 14.5; D. 15; A. 14; no scales, body nearly smooth; the upper lateral edges of snout sharply serrated; the 2 middle ridges on upper surface of snout well separated, being nearest together mesially. Color in spirits: Dirty brownish, lighter below; the young with a few scattered blue spots. Four specimens. Length 8–29 inches. Guam, June 14, 1900. *Hab.* East Indies, Australia, China, Panama, Lower California, Hawaiian Islands, Marianas.

FAMILY **PRISTOPOMATIDÆ.**

GENUS **SCOLOPSIS** CUVIER & VALENCIENNES.

56-59. Scolopsis lineatus[2] Quoy & Gaim. **Sihig.**

Head 3.20; depth 3; eye 3; snout 3.20; mandible equal to eye; interorbital 3; D. x 9; A. III 7; P. 16; V. I 5. Scales 3-44-12. Teeth minute, no canines. Inferior orbital with a spine directed backwards under the pupil—usually 2 or 3 smaller spines below it. Posterior margins of the opercles toothed. Body oblong, slightly compressed. Branchiostegals 5. Pseudobranchiæ developed. Gill-rakers short and blunt, 8 on lower limb. Fins: Caudal forked, the upper lobe the longest. Ventrals and pectorals of about equal length, 1.20 into head. Base of anal 3.50 into base of dorsal. About 14 rows of scales in front of dorsal fin. Color in spirits: Grayish above (in life the upper coloring is greenish), whitish below the axis. A more or less indistinct white line from snout to first dorsal spine. Two distinct white lines from above the orbit to sixth and seventh rays of soft dorsal. A third white line wider anteriorly, and more or less broken, extends from upper third of eye to just posterior of the hind margin of the dorsal fin. A fourth line forms the lower boundary to the gray coloring along the median line from eye to caudal. The upper half of pectorals has a dusky blotch, and there may be a dusky blotch, in some specimens, on the sides half way between the axis of body and the belly. Fins: All yellowish white, the spines with a bluish wash; no dark spot between first and third dorsal spines. Four specimens. Length 6–7.50 inches. Guam, June 14, 1900. *Hab.* Andamans, Malay Archipelago, Marianas.

FAMILY **MUGILIDÆ.**—MULLETS.

GENUS **MUGIL** (ARTEDI) LINNÆUS.

60. Mugil waigiensis Quoy & Gaim.

Head 4; depth 4.50; eye 4.20; 1 into snout; interorbital 1.66; D. IV, 7; A. III 8; P. 14; V. I 5. Scales 28. No adipose eyelid. Width of mouth is 2.66 Lips rather narrow, the upper lip one-half width of pupil. Body oblong, compressed, and covered with large scales. There are 16 series of scales between tip of snout and first dorsal spine. No lateral line. No true teeth in jaws. Fins: Caudal slightly emarginate. Pectorals equal to distance from posterior of head to anterior nostril. In the specimen before me the pectorals do not reach quite to the vertical of the origin of dorsal, but to the vertical of the next anterior row of scales. Ventrals and soft dorsal about equal in length, 1.50 into head. Spinous dorsal

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[2] I have carefully compared this fish with Quoy & Gaimard's description and figure (Quoy & Gaim. Voy. Freyc. Poiss., p. 322, pl. 60, fig. 3) and am convinced the species should stand as S. *lineatus*, Quoy & Gaim.

1.66 into head. Color in spirits: Silvery, with slight yellowish wash, slightly darker above. Pectorals dusky, with their lower margin yellowish. Anterior of anal dusky. Caudal, dorsals and ventrals yellowish white; iris yellow. One specimen. Length 13 inches. Guam, June 14, 1900. *Hab.* Red Sea, Indian Ocean, Polynesia, Marianas.

61. **Mugil axillaris** Bleek.

Head 3.50; depth 3.66; eye 3.50; interorbital 2.50; D. IV, 8; A. III 9. Scales 44. No adipose eyelid. No teeth in jaws. Pectorals reach to vertical base of dorsal, the tip of pectorals being on the 13 series of scales from the back of the head. The preorbital is indistinctly denticulate. Maxillary hidden. Snout shorter than orbit. Twenty-one series of scales between tip of snout and origin of dorsal. Caudal is slightly emarginate. Dorsal fins are of about equal length, the first dorsal spine is equal distance between tip of snout and base of caudal. Pectorals are equal in length to the distance from posterior edge of opercle to anterior nostril. An elongated scale in axis of pectorals. The origin of soft dorsal is very little behind origin of anal. Color in spirits: Silvery, with bluish wash, deeper blue on back. Ventrals white. Pectorals, dorsals, anal and caudal fins slightly dusky. One specimen. Length 3 inches. Guam, July 12, 1900. *Hab.* East Indian Archipelago, Marianas, Samoa.

62-64. **Mugil planiceps** Cuv. & Val. **Agoas.**

Head 4; depth 4; eye with adipose lid developed on fore and back of eye, but not extending on pupil. The clear part of eye 4.66 into head; interorbital 2.20. Scales 36; 19 series of scales from snout to first dorsal spine; D. IV, 18; A. III 9. There are 20 series of scales between origin of dorsal and tip of snout. The anterior margin of spinous dorsal is exactly midway between tip of snout and base of caudal fin. A lance-like scale above axes of pectorals. Lips thin. The pectoral fin barely reaches the vertical of base of dorsal, ending on the eighth scale of a lateral series. The soft dorsal has its origin above the third soft anal ray. Caudal rather deeply emarginate. Color in spirits: Silvery, with wash of yellowish, slightly darker above; more or less golden reflection behind eye. Pectorals white, the former with an indistinct dusky blotch at base. Caudal, dorsals and anal with more or less indistinct dusky wash. Three specimens. Length 3–6 inches. Guam, May 26, 1900. *Hab.* Coasts of Ceylon, Bengal, Hindostan, China, Marianas.

GENUS **SPHYRÆNA** (ARTEDI) BLOCH & SCHNEIDER.

65. **Sphyræna obtusata** Cuv. & Val.

Head 3; depth 8.50; eye 5.33; maxillæ 2.30; mandible 1.50; interorbital equal to eye; snout 2.20 into head; D. V, 19; A. 18. Scales 92, extending over opercles and cheeks. Body rather elongate, sub-cylindrical. Gape of mouth deep, the lower jaw the longest. Teeth sharp-pointed in jaws and palatines, none on vomer. Fins: Interspaces between the two dorsal fins equal to one-half length of head. Caudal forked. Ventrals equal to distance from hind margin of opercle to eye. Color in spirits: Grayish green above, yellowish white below. The gray descends in a festooned edge along the lateral line, giving the appearance of about 12 dusky splotches along the sides—this is more distinct in young. The young also show indistinct dusky bands over the back. Three specimens. Length 3-5.50 inches. Guam, July, 1900. *Hab.* Seas of India to Malay Archipelago, Marianas.

FAMILY **POLYNEMEDÆ**.—THREAD-FISHES.

GENUS **POLYDACTYLUS** LACÉPÈDE.

66. **Polydactylus sexfilis** Cuv. & Val. **Bocadulce.**

Head 3.5; depth 3.45; eye 4.50, more or less covered by adipose membrane; interorbital 3.66; premaxillary 2.20; mandible 2.20; D. VIII, I 2; A. III 12; P. 14; V. I 5. Scales 46; lateral line continuous; 5 free articulated appendages below each pectoral fin; two separate dorsal fins. Body oblong, compressed. Muciferous system of head well developed. End of snout projecting beyond the mouth. Teeth setiform, several bands on premaxillary, vomer and palatines. Vertical margin of the preopercle strongly denticulate. Fins: Caudal deeply forked, the longest ray one-third longer than head. Short middle ray 2.50 into head. Pectoral 1.20 into head. Longest ray of soft dorsal equal to head. Color in spirits: Silvery white, slightly darker above, a dusky splotch at base of caudal. Pectorals and anals dusky. Tips of dorsals dusky. One specimen. Length 13.5 inches. Guam, June 28, 1900. *Hab.* Seas of India, Polynesia, Marianas.

FAMILY **HOLOCENTRIDÆ**.—SQUIRREL-FISHES.

GENUS **MYRIPRISTIS** CUVIER.

67-68. **Myripristis murdjan** (Forsk). **Sagamolang.**

Head 3; depth 2.50; eye 2.20; snout 2 into eye; interorbital equal to snout; D. X, I 14; A. IV 12; P. 15; V. I 7. Scales 3-34-6. Body oblong, slightly elevated and compressed. Teeth villiform. Mouth oblique, lower jaw projecting, with a rough nipple-like projection on each side of symphysis. Maxillary reaches to beneath last third of orbit. Preopercle serrated its whole extent. Opercle with moderately strong spine, all the posterior margin below the spine and a little way above it finely serrated. Upper surface of head roughened by about four raised lines which branch posteriorly and end in small spines. Color in life: Roseate, gill openings and axillæ of pectorals black. Fins whitish, except a dusky blotch on tip of soft dorsal. Three specimens. Length 2–7 inches. Agaña, Guam, June 14, 1900. *Hab.* Red Sea, east coast of Africa, Seas of India to Malay Archipelago, Marianas, Hawaiian Islands.

GENUS **HOLOCENTRUS** (GRONOW) SCOPOLI.

69. **Holocentrus diadema** Lacép.

Head 3.20; depth 3; eye 2.50; interorbital equal to snout, 4.20 into head. Maxillary 3 into head and reaching to a line beneath the anterior margin of pupil. The upper processes of intermaxillaries end scarcely posterior of anterior margin of eye. D. XI 13; A. IV 9; P. 15; V. I 7. Scales 3-48-8; a single vertical row of 9 scales on the opercle. Orbital, opercular and preopercular bones serrated. The preorbitals have a large spine anteriorly; two opercular spines, the upper of which is much the stronger. The preopercular spine is 2.66 into vertical margin of preopercle and 2 into eye. Fins: Caudal well forked; the third, fourth and fifth dorsal spines the longest, about equal to longest ray of soft dorsal; third spine of anal much the longest, 1.20 into head, about equal in length to ventral fin. The scales on the sides of anal fin are much elongated and serrated. Color in life: Red, with lighter longitudinal lines. Color in spirits: Silvery grayish, darker above, with about 10 lighter longitudinal lines. Dorsal fin black, with a white longitudinal line through the middle, also an indication of light coloring on margin of fin. The web between third and fourth anal spine is black, otherwise all the fins are uniform yellowish white. Three specimens. Length 2.50–5.50 inches. Guam, July 28, 1900. *Hab.* Red Sea, Ceylon, Chinese Sea, Indian Archipelago, Marianas.

70. **Holocentrus operculare** Cuv. & Val.

Young: Head 3.20; depth 3; eye 2.50; maxillary equal to eye; interorbital 3.50 into head; D. XI 13; A. IV 10. Scales 37. Opercles and preopercles serrated, the preopercle spine equal to diameter of eye, and much smaller than the two spines of the opercles. Color, red; in spirits, a silvery grayish, slightly darker above. All the fins yellowish white, except the spinous dorsal which is black with white lines between the spines. One specimen, very young. Length 2 inches. Guam, July 23, 1900. *Hab.* Sea of New Ireland, Banda, Marianas.

71. **Holocentrus binolatum** Quoy & Gaim. **Cholog.**

Head 3; depth 2.66; eye 2.50; snout about equal to interorbital; D. XI 14; A. IV 9; P. 14; V. I 7. Scales 4-46-8. Opercles, preopercles, and orbitals with posterior and lower margins serrated. Maxillary reaching the posterior margin of pupil 2.20 into head. Mandible 1.66 into head. Preopercular spine long and strong, about twice as long as the two opercular spines. Preorbital with a strong spine anteriorly, and another not quite so strong under the anterior third of pupil. Fins: The third, fourth and fifth dorsal spines are longest, but are only two-thirds as long as third anal spine, and are rather shorter than the soft dorsal. Caudal well forked, the lobes equal. Pectorals slightly longer than ventrals, 1.25 into head. Color in spirits: Silvery whitish, with wash of yellowish. About 12 indistinctly darker stripes on body. Fins yellowish white, with a slightly darker splotch between the two anterior spines at base. The original description of this fish gives the dorsal fin as XI 14, and the figure in Voy. Astrol. Poiss., Pl. 14, Fig. 4, gives the stripes on the body, especially on lower half, as darker red than the ground color, which is very true of the specimen before me. One specimen. Length 5.50 inches. Guam, July 14, 1900. *Hab.* New Guinea, Guam, Marianas.

72. **Holocentrus unipunctatum** Gunth. **Lesiog.**

Head 2.66; depth 2.50; eye 3; interorbital 2 into eye; snout 3.20; maxillary 2.50; D. XI, 15; A. IV 10; P. 14; V. I 7. Scales 3-45-8. Opercles, preopercles and orbitals serrated. The preopercle spine, measured from scales, 1.66 into vertical limb of the preopercle, and about equal to eye; the two opercular spines of equal size and less than one-half the length of preopercular spine. Fins: The third, fourth and fifth dorsal spines the longest. Ventrals and pectorals of about equal length. Caudal well forked, lobes equal, the third anal spine the longest—2.66 into head. Color in life: Red, with about 12 slightly darker red lines. In spirits the fish becomes a dull grayish white, with very indistinct darker lines, the fins being a uniform yellowish white, except a small blotch of black between the first and second dorsal spines, near the base. One specimen. Length 5 inches. Guam, June 14, 1900. *Hab.* Polynesia, Marianas.

73-74. **Holocentrus fuscostriatus** sp. nov. **Chalak.**

Head 3; depth 3.50; eye 2.66; interorbital 4; snout 3.50; maxillary equal to distance from posterior of orbit to posterior edge of opercle; mandible 1.66; lower jaw projecting; D. X, I 12; A. IV 8; V. I 7; P. 14; C. 18, with 6 spines on each side. Scales 3-40-8; about 27 scales on preopercle, each scale with a brown spot at base. Posterior margins of opercles and preopercles denticulate, except the oblique lower half of sub-opercle. The opercle has a single vertical row of 8 scales on its anterior margin. Opercle with two spines from posterior margin, their exposed length 2 into pupil, a minute spine just above these two; lower margin of interopercle finely toothed; lower angle of preopercle with flat spine, its exposed length from scales 2 into orbit, 2.50 into horizontal length of preopercle. Preorbitals and sub-orbitals strongly denticulate. Mouth protracted.

Groove for the posterior processes of the intermaxillaries reaches to a line with the anterior margin of the pupil. No spine on snout. Teeth: Bands of villiform teeth on jaws, vomer and palatines. On top of head just posterior of eyes about 8 raised lines form a fan-shaped area on each side. Fins: The second dorsal spine is the longest, equal to distance from base of anterior dorsal spine to base of sixth dorsal spine. The first dorsal spine 2 into head, the last 2.50 into orbit. Third anal spine the longest, 1.33 into head. Soft dorsal and pectorals of about equal length, 1.66 into head. Ventrals 1.50 into head. Color in life: General color silvery, slightly darker above, with a wash of purplish red and gold, the scales with a splendid opalescent reflection, each side with 10 very distinct dusky lines which have a wash of purple madder. The lateral line, which is slightly the widest, is a brighter red with less of dusky. Top of head deep red. Spinous dorsal reddish with a big black splotch between the 4 anterior spines. A row of triangular white spots between the spines near base, and a marginal line of white. Soft dorsal yellow, with the two anterior rays red. Four outer rays on each margin of caudal red, the inner part yellow. Anal yellow, the fourth spine and first ray red. Pectorals pinkish. Belly and ventral fin white. Twenty-five specimens. Length 2-7 inches. Guam, July, 1900. The young are similar in color, with the lines not quite so distinct, and with two dusky blotches over each eye. Type specimen No. 73, B. P. B. M. *Hab.* Marianas.

75-76. **Holocentrus microstoma**[3] Gunth.

Head 3.20; depth 3.50; eye 2.66; snout one-third less than eye; maxillary equal to eye; mandible 2 into head; D. XI I 10; A. IV 9; P. 16; V. I 8. Scales 3-54-8; 8 series of scales in front of dorsal. Preopercles scaled. Opercle with a single vertical row of 8 scales which are deeply toothed posteriorly. Gill-rakers moderate, 12 including rudiments on lower limb. Hind margins of all the opercles, preopercles, the post, sub and preorbitals strongly serrated on their posterior or lower margins. Lower edge of preopercle with a prominent spine, the free portion from the scales measuring 2.20 into vertical limb of the preopercle, from lower margin of spine. Two prominent opercular spines, the upper much the largest. A prominent spine at the anterior end of preorbitals. Mouth projectile, lower mandible slightly the longest. Grooves for the posterior processes of the intermaxillaries ends anterior of a line with front of pupil. The turbinal bones end in prominent processes. Teeth villiform. Fins: Caudal well forked, with six small spines at base of each margin. Third anal spine the longest, equal to depth of the fish. Fourth and fifth dorsal spines the longest, 155 into head; the first dorsal spine is about equal to eye, and the last is equal to pupil. Pectorals 1.50 into head. Anterior rays of the

[3] Specimens from Guam show that *H. binotatum* and *H. microstoma* are distinct species.

soft dorsal are the longest, being equal in length to the fourth dorsal spine; the anterior rays of soft anal are also the longest, being equal to length of pectorals. Color in life: Red, with about 12 whitish longitudinal lines, most distinct on upper surface. Color in spirits: Silvery gray, with lighter longitudinal lines; fins all uniform yellowish white, except spineus dorsal, which has a rather narrow white margin and an intermarginal line of black, below which is another line of white. Two specimens. Guam, July 14, 1900. *Hab.* Polynesia, Marianas.

FAMILY **MULLIDÆ.**—SURMULLETS.

GENUS **MULLOIDES** BLEEKER.

77. **Mulloides flavolineatus** Lacép. **Salmoneti.**

Head 3.50; depth 4; eye 4; interorbital 3.50; width of maxillary at end 1.66 into eye; D. VII, 9; A. II 6. Scales 2-37-6 Body oblong, slightly compressed. Villiform teeth in both jaws, no teeth on vomer or palatines. Interorbital space flat. Barbules thick, reaching to angle of preopercle. Opercular spine small. Fins: Pectorals 1.50 into head. The longest dorsal spine 1.30 into head; the longest dorsal ray 2.20, equal in length to longest anal ray; 5 rows of scales between the two dorsal fins. Color in spirits: Back dusky, with slight wash of reddish; sides and belly with wash of yellowish, and indication of a yellowish line along sides. One specimen, length 11.5 inches; 14 young, length 3 inches. In some of these young the yellow band from head to caudal shows very distinctly. Guam, June 2, 1900. *Hab.* Red Sea, through India to Malay Archipelago and beyond, Marianas.

78. **Mulloides samoensis** Gunth.

Head 3.50; depth 3.50; eye 3; interorbital 3.66; mandible 3.50 into head; D. VII, 9; A. II 6. Scales 2-40-7. Villiform teeth in jaws in several series, no teeth on vomer or palatines. Fins: Pectorals 1.50 into head, equal in length to the longest dorsal spine. Longest dorsal ray 2 into head. Ventrals 1.30 into head. Barbules reaching to angle of preopercle. Color in spirits: Silvery white, a bluish wash above, a small dusky splotch on sides just below the ninth and tenth scale of the lateral line—the tips of the pectoral fins reach to the centre of this spot. An indistinct dusky blotch on interorbital region. One specimen. Length 4.50 inches (color much faded). Guam, June 2, 1900. *Hab.* Samoa, Marianas.

GENUS **UPENEUS** CUVIER.

79. **Upeneus multifasciatus** Quoy & Gaim.

Head 3.20; depth 3.20; eye 5.50; interorbital 3.50; maxillary 2.20, its width at end greater than eye; D. IX, 9; A. 7. Scales 2-30-6. Barbules long, reaching within two rows of scales from base of ventrals; two rows of scales between the two dorsal fins. Body oblong, compressed, the upper profile quite convex. Teeth in a single row in jaws, no teeth on vomer or palatines. A small opercular spine. Fins: Posterior rays of soft dorsal prolonged, 1.66 into head. Third dorsal spine the longest, 1.50 into head. The pectorals and ventrals are about equal in length. Color in spirits: Upper color brownish, with indication of purple. A brown line down snout through eye. A broad saddle of black on the caudal peduncle; another broad black band descends from the anterior half of soft dorsal. There are also indications of two or three more or less amalgamated broad black bands in front of this. Under surface yellowish white. Spinous dorsal dusky. Inner half of soft dorsal black, outer half marked with two or three longitudinal pale bluish lines. Pectorals cadmium yellow. Ventrals with external rays bluish, inner ones yellow. Anal bluish with 4 or 5 lighter longitudinal lines. Caudal dusky. One specimen. Length 8 inches. Guam, July 19, 1900. *Hab.* Seas of India, Malay Archipelago, Polynesia, Marianas.

80. **Upeneus saffordi**[4] sp. nov. **Salmoneti.**

Head 3; depth 3.25; eye 5.66; interorbital 4; maxillary 2.50, its width at end equal to eye. Scales 2-30-7; D. VIII, I 8; V. I 5. Barbules long, reaching to base of ventral fins. Body oblong, compressed, the upper profile quite concave. Snout rather sharp-pointed. The distance from the anterior margin of orbit to tip of snout 1.86 into head. Teeth in a single row in each jaw, no teeth on vomer or palatine. Three series of scales between the two dorsal fins. A small preopercular spine. Fins: Spinous dorsal and ventrals of about equal length, 1.25 into head. Second ray of soft dorsal 2 into head, equal in length to base of fin. Base of anal 2.50. Pectorals 1.60 into head, their base equal to shortest ray, their tip reaching to a line with the tenth scale of lateral line. Caudal well forked, the longest ray 1.25 into head. The posterior rays of the anal or dorsal are not prolonged. Color in life: Uniform cadmium yellow, with a saddle of bright yellow extending over the upper part of caudal peduncle and down to the lateral line, with two distinct bluish lines from eye, two-thirds of the distance down sides of snout. Color in spirits: Uniform yellowish white, a whitish saddle over top of caudal peduncle down to lateral line, a dusky reddish splotch covering sides of snout. Fins all uniform light chrome; iris bright yellow. The young are similarly colored, but without the yellow marking on caudal peduncle so distinct. Two specimens. Length 6.50–3.00 Agaña, Guam, July 14, 1900.

81. **Upeneus trifasciatus** Lacép.

Head 3.20; depth 3.20; eye 4.50; maxillary 3.66 into head. Scales 2-30-6; D. VIII, 9; A. 7; snout blunt. Teeth in a single row in jaws, none on vomer or palatines. Barbules reaching about to angle of preopercle. Fins: Spinous dorsal 1.50 into head. Longest ray of soft dorsal 2 into head. Two rows of scales between soft and spinous dorsal. Color in spirits: Scales of upper surface more or less edged with brownish, below yellowish white. A brown line from end of snout through eye to below soft dorsal fin; back of the head this brown line is accompanied on each side by a yellow line of almost equal width. A dusky saddle over free portion of tail, with a yellowish spot between it and the soft dorsal. A more or less dusky line down posterior margin of preopercle. Base of opercular spine dusky. One specimen. Length 8 inches. Guam, May 26, 1900. *Hab.* Indian Ocean, Polynesia, Marianas.

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[4] Named in honor of Lieutenant-Governor W. E. Safford, U. S. N., of Guam, in recognition of his interest and work in Polynesian natural history.

FAMILY **CARANGIDÆ**.—POMPANOS.

GENUS **CARANX** LACÉPÈDE.

82. Caranx ascensionis (Forst.). **Tarakita.**

Head 3.33; depth 2.66; eye 5.33, 2 into snout; interorbital 4; D. IX, I, 22; A. II, I 19; V. I 5. Scales about 58 to the beginning of the plate-like scales which arm the posterior half of the lateral line; there are 48 of the plate-like scales which begin on a line of the fifth dorsal ray. Body oblong, compressed. Mouth protractile, the lower jaw slightly the longer. Maxillary broad, almost as wide as eye. Preopercle not serrate. Branchiostegals 7. Pseudobranchiæ present. Teeth: The teeth in the upper jaw in villiform band, with an outer series of stronger ones; those of the lower in a single series; minute teeth also on palate and tongue. Fins: The dorsal consists of a recumbent spine followed by seven rather weak spines, all connected, the longest being 2.75 into head; following these and scarcely connected with them is a short strong spine about midway between the spinous dorsal proper and soft dorsal. The soft dorsal is about equal in length to anal and similar in form; the longest ray is contained 1.33 into head, being a little longer than the first ray of anal; there are no detached rays. The pectorals are long and falcate, their length greater than head, 3 into total length. Ventrals short, 2.50 into head. Caudal well forked, lobes equal, 4 into total length. The body is finely scaled, there being no bare area in front of ventrals. Lateral line strongly curved, the curved portion 1.50 into straight. Color in spirits: Silvery with a slight wash of yellowish. Pectorals yellow. Dorsal and anal bluish. The outer rays of caudal seem to have more or less yellowish wash. One specimen—length 13 inches—and 13 young 2.50-4.50 inches, were taken near the reef. Guam, July 9, 1900. The young are unstriped and have more bluish on the back, and the fins with less color. *Hab.* Gilbert Islands, Marianas.

83. **Caranx sexfasciatus** Quoy & Gaim.

Head 3.33; depth 2.50; eye 3.50, 1 into snout; interorbital 3.66; D. VIII, I, I 21; A. II, I 19. Scales numerous, plates 33. Lateral line strongly curved, the curve 1.66 into straight portion. Lower jaw slightly longer than upper. Breast scaly. Teeth of upper jaw form a villiform band, an outer series of larger ones also present, a single row in lower jaw, small teeth on palate. Color: Silvery, bluish above, with about seven dusky vertical bands about equal to width of eye and narrower than interspace. An indistinct opercular spot. Fins yellow. Two specimens, length 4.50 inches, were taken at Agaña, Guam, July 9, 1900. *Hab.* Western Pacific, Marianas.

GENUS **LEIOGNATHUS** LACÉPÈDE.

84-86. **Leiognathus obscura** sp. nov.

Head 3.33; depth 1.66; eye 2.80, 1 into snout; interorbital 3; D. VIII, 17; A. III 15; V. I 5. Scales small, deciduous, cycloid, no scales on chest. Lateral line unarmed and but slightly curved. Body elevated and strongly compressed. Mouth protractile, upper jaw rather overhanging. Teeth minute, of equal size in jaws. Preopercle and supraorbital serrate. Two short spines on upper anterior part of orbit, the distance between two outer spines 2.50 into head. Branchiostegals 5. Pseudobranchiæ present. Gill-rakers short but wide, with many small teeth. Fins: Second dorsal spine 3.80 into length, the third dorsal spine equal in length to second anal spine, 1.50 into head. Pectorals and second dorsal spine of equal length. Ventrals small, 2 into head. Caudal well forked, lobes of equal length; caudal peduncle 4 into head. The pores of lateral line are slightly enlarged anteriorly. Color: Silvery white, bluish above. An irregular dusky splotch about the size of eye a little below the axis, above anterior anal spine. The inner bases of pectorals are black. A dusky splotch at upper edge of opercle, another at upper margin of orbit—this invades the upper part of iris, which otherwise is yellow. Snout more or less dusky with a short black line down each side from nostrils to upper lip. A dusky splotch on upper part of caudal peduncle. Fins white, a wash of yellow on caudal. Three specimens, length 3–5.50 inches, taken at Agaña, Guam, May 26, 1900. No. of type 84 B. P. B. M. *Hab.* Marianas.

FAMILY **PEMPHERIDÆ.**

GENUS **PEMPHERIS** CUVIER & VALENCIENNES.

87-90. **Pempheris otaitensis** (Cuv. & Val.). **Sapi sapi.**

Head (from bony margin of opercle to tip of snout) 4; depth 2.50; eye 2.25; maxillary 1.60; mandibles 1.50; interorbital 1.50 into eye; from anterior margin of orbit to tip of snout is one-half the diameter of eye; D. VI, 9; A. III 41; V. I 5; P. 19. Scales about

68–70 in lateral line. Mouth oblique. Setiform teeth on jaws, vomer and palatines. Snout blunt. Branchiostegals 7. Fins: Anal long, its base twice into length of fish. It is placed at an angle of about 40° to the axis. The rays are short, the longest being equal to the diameter of eye. The base of dorsal is 1.66 into head, its longest ray being about equal to head. Caudal emarginate. Pectorals about equal to length of head. Color in spirits: Silvery, with a wash of reddish, each scale having a silvery margin with a sub-marginal brownish red area of about equal extent; darker above. Axis and base of pectorals black, a darker area along base of anal. Dorsal spines and tip of anterior dorsal rays black. Caudal dusky on edges, lighter in centre. Anal, pectorals and ventrals yellowish white. A more or less distinct splotch of gold just posterior of eye on opercle. Iris yellow. Five specimens. Length 3-7 inches. Guam, July 14, 1900. *Hab.* Western Pacific, Marianas.

FAMILY **KUHLIIDÆ.**

GENUS **KUHLIA** GILL.

91-93. **Kuhlia rupestris** (Lacép.).

Head 3; depth 2.66; eye 4; maxillary 2.33, no supplemental bone; mandible 1.66; interorbital 3.50; D. X 11; A. III 10; V. I 5; P. 13. Scales large, 5-44-9, lateral line complete. Body oblong, slightly compressed. Mouth large, protractile. Teeth: Bands of villiform teeth on jaws, vomer, palatines, entopterygoid and ectopterygoid bones. Tongue smooth. Gill-rakers about 16, rather short on lower limb. Branchiostegals 6. Pseudobranchiæ well developed. Opercle with two spines. Preorbital and preopercle finely denticulate, gill membranes separate. Fins: The caudal is emarginate, the lobes rounded. Fifth dorsal spine is 2.50 into head; tenth dorsal spine is much longer than ninth, its length 3 into head. Ventrals and pectorals of about equal length. Anal longer than its distance from caudal. Color in spirits: Dark silvery, bluish above, most of the scales with a blackish spot at tip or base. Caudal, anal and dorsal dusky, with a wide whitish space at tip. Ventrals white. Pectorals whitish, upper ray black. Three fine specimens, length 6-9 inches, were presented to the Museum by Lieutenant-Governor W. E. Safford, U. S. N. These were taken in fresh water at the head of the Agaña river, Guam, 1900. This is a valued food fish. *Hab.* Fresh water streams and lakes of Polynesia, Marianas.

FAMILY **CHEILODIPTERIDÆ.**—CARDINAL-FISHES.

GENUS **APOGON** LACÉPÈDE.

94. **Apogon fasciatus** Quoy & Gaim. **Lansi.**

Head 2.86; depth 3; eye 2.50; snout 50 into eye; interorbital about equal to snout; maxillary reaching beyond pupil 1.23 into head; D. VI, I 9; A. II 8. Scales 1-28-4. Teeth villiform in jaws, vomer and palate. Body oblong, slightly compressed and elevated. Branchiostegals 7. The preopercle has a double edge, the outer one of which is serrated. Gill-rakers rather long and slender, 12 on lower limb. Fins: Caudal emarginate. Pectorals and ventrals of about equal length, 1.50 into head. The spinous and soft dorsals separate, the soft dorsal the longest. Base of anal slightly less than base of soft dorsal. Color in spirits: Yellowish white with wash of red. Four lateral longitudinal black bands on each side from head to caudal, the second and fourth lines form an arch on the base of caudal fin. A black band on base of anal, also a black band on base of soft dorsal. Other fins yellowish. Lower jaw more or less dusky. Twenty specimens. Length 1–3 inches. Guam, June 14, 1900. *Hab.* Seas of India, Malay Archipelago, Marianas.

95. **Apogon auritus** Cuv. & Val.

Head 2.50; depth 2.86; eye 3.50; D. VII, 9; A. II 7; interorbital 2 into eye; maxillary 2 into head. Scales 23. Teeth villiform in jaws, vomer and palatines. No canines. Bones of the head not serrated. Caudal rounded. Color in spirits: Yellowish brown, with darker spots over body. A black spot half as large as eye and margined with white on the opercle. One specimen. Length 2.25 inches. Guam, July 12, 1900. *Hab.* Red Sea, Seas of India to Malay Peninsula, Marianas.

96-98. **Apogon savayensis** Gunth.

Head 2.66 (without flap); depth 2.66; eye 2.55; snout 1.66 into eye; maxillary 1.66; mandible 1.50; D. VII, I 9; A. I 8. Scales 2-27-5. Body oblong, compressed. Preopercle with a double edge. Teeth villiform in jaws, vomer and palatines. Fins: Caudal slightly emarginate. Length of spinous dorsal 1.66 into head. Base of anal equal to eye. Pectorals slightly longer than the ventrals. Color in spirits: Olive, a dusky saddle over free portion of caudal peduncle. A dusky oblique line from lower posterior edge of orbit to lower posterior edge of opercle. There are slight indistinct indications of four other dusky bands descending from the dorsal fins to belly. Ventrals white. All the remaining fins more or less dusky. Seven specimens. Length 2–4.50 inches. Guam, June 14, 1900. *Hab.* Coasts of Africa, Seas of India, Marianas.

FAMILY **SERRANIDÆ**.—SEA BASSES.

GENUS **EPINEPHELUS** BLOCH.

99. **Epinephelus dæmetii** Gunth.

Head 2.66; depth 3.66; eye 4.66; width of maxillary at distal end 2.50 into eye; mandible 1.50 into head; interorbital 2 into eye; D. XI, 16; A. III, 8; V. I 5; P. 17. Scales small, about 85 in lateral line. Teeth in narrow bands in 2 series on the sides of the mandibles. Canines strong. Villiform teeth also on palatine bones and vomer. Branchiostegals 7. Pseudobranchiæ present. Maxillary reaching past vertical of posterior of eye, lower jaw projecting. Border of preopercle rounded and serrate, the serræ slightly larger at angle. Gill-rakers short, 13 on lower arm, with villiform teeth. Fins: Caudal rounded, its length about 2 into head. Soft anal slightly longer than soft dorsal. Third anal spine the longest, 2.50 into head. Fifth dorsal spine the longest, 2.66 into head. Pectorals rounded, 1.50 into head, their base about equal to orbit. Ventrals not reaching to anus. Color in spirits: Brownish, with mottlings and narrow lighter more or less hexagonal lines, white below, the body with about six indistinct slightly oblique bands about as wide as interspaces. The dorsal parts of these bands are very black and distinct, less distinct on sides; the first is on the shoulders, second from 2–5 dorsal spine, third from 7–10 dorsal spine, fourth from 2–6 dorsal ray, fifth from 12–14 dorsal, and the sixth forms a black saddle on caudal peduncle. All of these bands extend a little obliquely down to the ventral surface of body. The thorax has 9 round brown spots half as large as eye. The caudal is brown with small white spots and a narrow white margin. The pectorals a yellowish without distinct markings. Anterior of ventrals dusky, remainder of fin white with about 9 brown spots. Tip of anal black. The general coloring of both the anal and dorsal is brown with lighter lines reticulating through them. One specimen. Length 6.5 inches. Guam, July 12, 1900. This species is well figured in Boul. Cat. Fishes, 2 ed., p. 223, Pl. VII. *Hab.* Western Pacific, Marianas.

100-103. **Epinephelus hexagonatus** (Bl.). **Gadua.**

Head 2.66; depth 3.20; eye 5; distal width of maxillary reaches to below hind edge of orbit 2.50 into eye; mandible 1.50 into head; interorbital 1.33 into eye; D. XI 16; A. III 8; V. I 5; P. 16. Scales small ctenoid, about 108 in lateral line. Upper two-thirds of hind margin of preopercle finely serrated, lower third coarsely so. Hind margin of opercle with three spines equidistant apart, the middle one the largest, its length about 2 into orbit. Fins: The caudal is rounded, its length about 2 into head. Pectorals rounded, their length 1.66 into head, their base about equal to orbit. The soft dorsal and soft anal are about equal in length, 2.50 into head. Color in spirits: Brown, with light reticulations covering the body, giving the appearance of hexagonal, sometimes rounded, or more or less confluent spots. These spots not only cover the entire body but all the fins also. On the pectorals, however, the spots are smaller and more nearly in rows. Four specimens. Length 4–8 inches. Agaña, Guam, July 12, 1900. *Hab.* Western Pacific, Polynesia, Marianas.

FAMILY LUTIANIDÆ.—SNAPPERS.

GENUS LUTIANUS BLOCH.

104-106. Lutianus fulvus (Bl.). Kakaka.

Head with flap 2.60; depth 3; eye 3.66; interorbital less than eye; snout 3; D. x 14; A. III, 8. Scales 52, which are oblique above lateral line, horizontal below. Maxillary equal to length of snout. Interopercular knob well developed. The vertical limb of the preopercle with a deep emargination and a produced rounded angle; above the notch the limb is serrated. Branchiostegals 7. Pseudobranchiæ developed. Body oblong, compressed. Fins: Caudal fin emarginate. Length of pectorals equal to distance from posterior margin of opercle to anterior nostril. Base of anal about 4 into base of dorsal. Ventrals 1.66 into head. Color in spirits: Uniform yellowish, with slight wash of reddish. A dusky splotch in axis and on base of pectorals. The upper third of dorsal black, with a narrow white margin. Caudal more or less dusky, with a narrow white margin. An indistinct dusky mark near middle of anal. Pectorals and ventrals yellow. Three specimens. Length 6–8 inches. Guam, June, 1900. *Hab.* Andamans, Polynesia, Marianas.

107. Lutianus bengalensis (Block.).

Head 2.50, including opercle flap; depth 3; eye 4; interorbital 2.33 into snout; D. x 15; A. III 9; V. I 5; P. 15. Scales 64. Maxillary 2.66 into head. Vertical limb of the preopercle with a notch above its rounded angle. Interopercular knob distinct. Teeth villiform on vomer and palatines, small-sized canines in premaxillary with a row of small curved conical teeth in each jaw. Gill-rakers of moderate size, 13 on lower limb. Fins: Caudal forked. Pectorals equal to distance from tip of opercular flap to hind nostril. Ventrals about 2 into head. Base of anal 3.86 into base of dorsal. Color in spirits: Yellowish white, a slight wash of bluish above. Four blue, brown-edged stripes, one-half as wide as pupil, along sides of body; first from interorbital to eighth dorsal spine, second from upper posterior margin of orbit to 4–6 dorsal ray, third from upper anterior margin of opercle on a line with middle of orbit to behind the last dorsal ray, fourth from sides of snout below orbit across opercles to middle of caudal fin. Fins: Yellowish white. Dorsal with dusky tip. One specimen. Length 7 inches. Guam, June 14, 1900. *Hab.* Red Sea, seas of India, Malay Archipelago, Marianas.

108. Lutianus erythropterus Bl.

Young: Head 2.50; depth 2.66; eye 3.20; interorbital 6 into head; snout equal to eye; maxillary reaches to below the pupil; D. x, 13; A. III 8. Scales 55. Body oblong, compressed, and slightly elevated. Color in spirits: Yellowish white, with a slight wash of reddish brown. Fins: Yellowish white, the dorsal with a fine black margin. Twenty-seven small specimens. Length about 1 inch. Guam, June 1, 1900. *Hab.* Red Sea, coast of Africa, seas of India to Malay Archipelago, Marianas.

109-110. **Lutianus bonhamensis** Gunth. **Mafuti.**

Head 3; depth 3; eye 3.66; interorbital 3.18; snout 2; maxillary 2.50 into head, not reaching to orbit; mandible 2.20; D. x 9; A. III 8; P. 14; V. I 5. Scales 6-48-15. Body oblong, compressed. Brachiostegals 6. Teeth villiform in anterior portion of jaws, with 4 canines in front of them; the teeth in hind part of jaws rounded molars, 8 on each side behind the canines, the 4 anterior of these rather sharply pointed. Fins: Caudal emarginate. Pectorals about the length of head. Ventrals reaching to anal opening, 1.50 into head. Base of anal 2.66 into base of dorsal, the third, fourth and fifth dorsal spines the longest—about one-third the depth of body. Color in spirits: Grayish, with a wash of olive; more or less indistinct dusky mottlings on back and sides; sometimes a large black splotch on middle of sides. Axis of pectorals bluish. Fins yellowish white. Two specimens. Length 8–10 inches. Guam, June 14, 1900. *Hab.* Marshall Islands, Marianas.

111. **Lutianus monostigma** (Cuv. & Val.). **Buah.**

Head 2.50; depth 2.50; eye 4; interorbital 5; snout about equal to eye; maxillary 2.33; D. x 13; A. III 8. Scales 50. Body oblong, somewhat compressed. Maxillary reaching to below hind third of eye. Color in spirits: Whitish, with a slight wash of reddish brown. A distinct black spot on the lateral line under the anterior soft dorsal ray. Fins yellowish white. Two specimens. Length 2 inches. Guam, May 26, 1900. *Hab.* Polynesia, Marianas.

FAMILY **CIRRHITIDÆ.**—CIRRHITOID-FISHES.

GENUS **PARACIRRHITES** STEINDACHNER.

112. **Paracirrhites arcatus** (Perkins).

Head 3; depth 2.50; eye 4; interorbital 2 into snout; D. x 11; A. III 6. Scales 5-42-10. Maxillary 2.30. Body oblong and compressed. Branchiostegals 6. Preopercle denticulate. Teeth villiform in both jaws, with a few small canines; villiform teeth on vomer. Fins: Seven simple rays in the pectorals. Caudal square. Anterior rays of soft dorsal elongate. Base of anal 3.25 into base of dorsal. Color in spirits: Reddish brown, a wide white line above the lateral line from below fifth dorsal spine to the upper half of caudal. A white, brown-edged semicircular ring obliquely behind eye. Three narrow oblique whitish lines on sub-opercle. One specimen. Length 4.5 inches. Guam, June 2, 1900. *Hab.* From Mauritius to Pacific, Marianas.

FAMILY **GARRIDÆ.**—MOJARRAS.

GENUS **GARRES** CUVIER.

113. **Garres argyeus** Cuv. & Val.

Head 3.33; depth 3; eye 3.50; mandible 2.20; interorbital 3; D. IX 10; A. III, 8; P. 16; V. I 5. Scales 45. Body slightly elevated, oblong and compressed. Snout very protractile. Branchiostegals 6. Pseudobranchiæ well developed. The groove for the processes of the intermaxillary bones does not extend to the vertical from the centre of the eye. Teeth setiform, lower pharyngeal bones firmly united by a suture. Fins: Caudal well forked, scaled. Pectorals longer than head. The first dorsal spine is contained 1.50 into head. The dorsal fin has a scaly sheath into which the fin is received. Color in spirits: Uniform silvery, tip of dorsal dusky, a dusky line from dorsal to forehead, and an indistinct dusky blotch on tip of snout. One specimen. Length 15 inches. Guam, July 12, 1900. *Hab.* Red Sea, Australia, Marianas.

FAMILY **POMACENTRIDÆ.**—DEMOISELLES.

GENUS **POMACENTRUS** LACÉPÈDE.

114. **Pomacentrus punctatus** Quoy & Gaim.

Head 3; depth 1.66; eye 2.50; snout equal to eye; D. XII 15; A. II 13. Scales 24 in the lateral line, which terminates under posterior half of soft dorsal. Body short and compressed. Branchiostegals 5. Gill-rakers small, length less than pupil of eye. Teeth small setiform. Preopercle serrated. Fins: Caudal emarginate. Ventral fins somewhat produced, the longest ray greater than length of head. Length of pectorals slightly less than head. The soft anal slightly longer than soft dorsal. Color in spirits: White, with a slight wash of grayish brown. Each scale with a small blue dot, larger dots on sides of head, and a lighter wash on preorbitals. A black spot on base of posterior. Three soft dorsal rays and a black spot in axil of pectoral fins. All the fins yellowish white, a slight wash of dusky on ventrals and anal. Two specimens. Length 2 inches. Guam, July 1, 1900. *Hab.* Red Sea, Andamans, Malay Archipelago, Marianas.

115. **Pomacentrus trimaculatus** Cuv. & Val.

Head 3; depth 2; eye 3; snout slightly longer than diameter of eye, 2.66 into head; D. XII 15; A. II, 16; interorbital equal to eye. Scales 20 (with tubules). Body short and compressed. Suborbital and posterior edge of preopercle serrated. Teeth small. Fins: Ventrals with first rays rather elongate, equal to length of head. Pectorals 1.20 into head. Caudal emarginate. Color in spirits: Almost uniform greenish, a dusky splotch on posterior part of dorsal fin, some bluish spots on opercles and cheeks. Two narrow blue lines go from one orbit to the other. A row of bluish dots more or less connected directly below the eye. A narrow blue line from front of orbit to snout. One specimen. Length 2.5 inches. Guam, June 1, 1900. *Hab.* Andamans to Malay Archipelago, Marianas.

116. **Pomacentrus littoralis** Kuhl.

Head 3.20; depth 2; eye 3.50; snout and interorbital equal to eye; D. XIII 14; A. II 14. Scales 19 in lateral line proper, which ends under middle of soft dorsal. Teeth in single row in both jaws. Sub-orbital and vertical limb of preopercle serrated. Body short and compressed, the chin and forehead equally convex. Greatest depth of preorbital about one-half diameter of eye. Fins: Caudal emarginate. Ventrals longer than head. Pectorals equal to head. Base of anal 2.20 times into base of dorsal, the longest soft dorsal rays about equal to longest soft anal rays. Color in spirits: Brownish olive, either uniform or with some indistinct darker spots. A black spot at base of pectorals. An indication of bluish markings on sides of head, *i. e.*, on sub-orbital. Five specimens. Length 2-4 inches. Guam, June 1, 1900. *Hab.* Andamans, Malay Archipelago, Australia, Marianas.

117. **Pomacentrus bankanensis** Bleek.

Head 3.50; depth 2; eye 3; snout and interorbital equal, and each slightly less than the eye; D. XIII 14; A. II 15. Scales 17 to where line terminates. Sub-orbital and preopercle serrated. Body short and compressed. Branchiostegals 5. Fins: Ventrals slightly longer than head. Pectorals equal to head. Base of anal 2 into base of dorsal. Caudal emarginate. Color in spirits: Brownish, each scale with a blue dot. Two narrow blue lines on forehead, converging on snout and extending on to back. A deep blue, almost black spot on upper opercle; another margined with bluish white on bases of the eleventh, twelfth and thirteenth soft dorsal rays. Pectorals and caudal yellowish white. Ventrals, anal and dorsal more or less dusky. Three specimens. Length 1.50–3.50 inches. Guam, June 2, 1900. *Hab.* Andamans, Malay Archipelago, Marianas.

GENUS **AMPHIPRION** BLOCH.

118. **Amphiprion ephippium** Bl. **Gadudog.**

Head 3.25; depth .75; eye 4 into head; profile rounded and blunt; D. X, 16; A. II, 14. Scales 7-40-18. Color: Brownish black, lighter anteriorly with a white band. Blue in life. One and one-half times as wide as eye, extending from the neck to eye, and down along the opercle and preopercle, ending in an acute angle on the sub-opercle. Fins: Ventrals and anal black. Pectorals, caudal peduncle and fin yellow. The spinous dorsal is dusky, the soft dorsal is light yellow. The posterior of caudal and anal is rounded; the posterior of dorsal forms an acute angle. The interorbital space is about twice as wide as eye. The opercles are all distinctly toothed and ridged on their posterior parts. Four specimens, 3-4.50 inches in length, were secured inside the reef, Agaña, Guam, June 14, 1900. *Hab.* Sea of Amboyna, Polynesia, Marianas.

119. **Amphyprion bicinctus** Rüpp.

Head 3.50; depth 2; eye 3 into length of head and less than length of snout; D. x, 16; A. II, 14. Scales about 7-44-20. Color: Blackish brown, with two china-white cross bands—blue in life; the first is of equal width with eye and extends over the neck vertically down to lower edge of opercle, the other extends vertically down from the eighth-ninth dorsal spine to the anal opening. Anterior part of head, thorax and fins orange. Fins: Posterior of anal and dorsal fins form acute angles. The caudal is emarginate, the upper lobe produced. Pectorals long, reaching to second white band. Teeth: In single series, small, conical. Opercle and preorbital armed with teeth, those on the opercle and sub-opercle being almost as long as width of pupil. One specimen secured at Agaña, Guam, July 14, 1900. Length 3 inches. *Hab.* Red Sea, Polynesia, Marianas.

GENUS **ABUDEFDUF** FORSKÅL.

120. **Abudefduf septemfasciatus** Cuv. & Val.

Head 3.20; depth 1.86; eye 3.86; interorbital 2.50; D. XIII 12; A. II 11; V. I 5. Scales 3-22-11. Body oblong, compressed and elevated. Snout 2.50 into head. A small eyelid on upper anterior part of eye. Preoperculum not denticulate. Teeth fixed, compressed, in a single series. Fins: Vertical fins scaled. The caudal well forked, the upper lobe the longest. Length of longest dorsal ray 1.20 into head, length of longest dorsal spine 1.66 into head. Pectorals equal to length of ventrals, slightly longer than head. Anal rounded, the longest ray equal to longest ray of dorsal; the base is 2.66 times into base of dorsal. A small flat spine from posterior margin of opercle. Color in spirits: Ground color of silvery grayish, with seven brownish cross bands which are broader than the interspaces; first, rather indistinct from occiput to preoperculum; second, from nape and anterior base of dorsal to pectoral; third, fourth, fifth and sixth extend from the dorsal fin; the seventh from a band on the caudal peduncle directly behind the dorsal and anal fins. Fins dusky, except the pectorals which are whitish with a black spot on upper base. Upper part and sides of snout blackish. One specimen. Length 6.50 inches. Guam, June 1, 1900. *Hab.* Mauritius to Philippine Islands, coast of China, Marianas.

121. **Abudefduf brownriggii** Benn.

Head 3.68; depth 3; eye 2.66; snout and interorbital space equal and less than eye; D. XIII 13; A. II, 13. Scales 26. Inferior orbital and preopercles not serrated. Body compressed and rather short, the snout and chin quite short and rounded. Color in spirits: Bluish to yellowish brown, some with small blue dots, some specimens with one or two black spots on base of soft dorsal fin. One specimen has a lighter yellowish band around caudal peduncle, and a large yellow splotch on opercles. Some specimens have two bluish lines on forehead. Four specimens. Length 1–3.25 inches. Guam, June 1, 1900. *Hab.* Polynesia, Marianas.

122. **Abudefduf antjerius** Kuhl.

Head 3; depth 2.20; eye 3; snout and interorbital space equal, and less than eye; D. XIII 13; A. II 13. Scales 26. The scales on top of head are continued forward to anterior margin of eye. Body short, compressed. Branchiostegals 5. Pseudobranchiæ present. The anterior profile is rather more short and stubby than in most species of this genus. Fins: Caudal slightly forked. Pectorals about equal to length of head. Base of anal 2.55 into base of dorsal. Color in spirits: Brownish, almost without markings, to bluish with two or three minute lighter dots on each scale. A black spot at the base of dorsal. One specimen is lighter on belly and thorax. A blue line along sub-orbital. A black spot in upper axis of pectorals. Caudal yellow. Pectorals yellowish white, remaining fins dusky. Two specimens. Length 2 inches. Guam, July 14, 1900. *Hab.* From Red Sea to India and Malay Archipelago, Marianas.

123. **Abudefduf lacrymatus** Quoy & Gaim.

Head 2.66; depth 2.05; eye 2.86; snout equal to interorbital and less than orbit; orbitals and preopercles not serrated; D. XII 14; A. II 13. Scales 27. The tubules of lateral line ending under middle of soft dorsal, the line being continued by small circular pores. The preorbital above angle of mouth one-half diameter of eye. Body short and compressed. Branchiostigals 5. Pseudobranchiæ present. Teeth small, compressed, and in a single row. Fins: Ventrals equal to length of head. Caudal emarginate. Base of anal 3 into base of dorsal. Color in spirits: Brown, with small scattered blue spots, some specimens almost plain. Hind portion of soft dorsal and caudal yellowish white. Pectorals white with black at base. Anal and ventrals dusky. Seven specimens (young). Length 1–2 inches. Guam, July 23, 1900. *Hab.* Coast of Java, Ternate, Marianas.

124. **Abudefduf dickii** Lienard. **Fomho.**

Head 3.20; depth 1.66; eye 3; snout equal to eye; interorbital 2.66 into head; D. XII 15; A. II 14. Scales 30. Body short and compressed. Opercles entire. Teeth compressed and in a single row. The tubular portion of the lateral line stops below posterior end of soft dorsal fin. Fins: Caudal well forked. The anterior rays of dorsal and anal somewhat prolonged. Rays of ventral equal to or slightly longer than head. Vertical fins scaled. Color in spirits: Grayish brown, with a black band on posterior third of body, descending from third-seventh dorsal rays to middle of soft anal. Caudal and pectorals yellowish white, slightly dusky at tip, the remaining fins dusky. One specimen. Length 4 inches. Guam, June 14, 1900. *Hab.* Samoa, Caroline Islands, Marianas.

125. **Abudefduf amboinensis** (Bleeker).

Head 2.30; depth 2.33; eye 2.66; interorbital equal to orbit; maxillary 2.66; scales 2-27-7; D. XIII 9; A. II 10. Body oblong, compressed. Snout shorter than diameter of eye, each jaw with about 40 small teeth. Fins: Dorsal and anal fiins with their middle rays longest. Caudal deeply forked with the lobes much produced. Pectorals and ventrals of about equal length, 1 into head. Color in spirits: Brownish violet, slightly lighter below. A deep brown spot at base and in axil of pectorals. All the fins more or less washed with bluish, except pectorals which are white. Six specimens. Length 3.50 inches. Guam, June 14, 1900. *Hab.* Amboyna, Marianas.

GENUS **TETRADRACHMUM** CANTOR.

126. **Tetradrachmum aruanum** Linn.

Head 3.50; depth 1.75; eye 2.75 into length of head; snout slightly shorter than width of eye; D. XII 13; A. II 11. Scales 3-26-11. Color: Whitish with three broad black cross bands, the first ascending obliquely upwards and back from the chin through eye to base of spinous dorsal; the second covers the ventral fins and extends in a slightly curved course to the fifth-ninth dorsal spines; the third embraces the soft anal, extends ventrally upwards on to the soft dorsal. Caudal fin white. The interorbital space is white. This is a very abundant little fish about the coral reefs, and were easily caught by lifting the chunks of dead coral out of the water and holding it over a net, the fishes, which were hidden in the holes of the coral, dropping out into the net. One hundred and twenty-five specimens were secured. Length .50-2.50 inches. Guam, June, 1900. *Hab.* Eastern coast of Africa, seas of India, Polynesia and New Zealand, Marianas. Numerous at the Andamans, Nicobars and Burmah. Much rarer in western than in eastern India.

FAMILY **LABRIDÆ.**—URESSE-FISHES.

GENUS **HARPE** LACÉPÈDE..

127-128. Harpe axillaris (Benn.). **Higum.**

Head 3; depth 3; eye 4.66; interorbital 3.50; D. XII 10; A. III 12. Scales 4-32-12. Body oblong and compressed. Branchiostigals 6. Pseudobranchiæ present. Teeth: The four anterior canines conical and free, teeth on sides of jaws in single row, a posterior canine at angle of jaws. Fins: Caudal square. Pectorals and ventrals of about equal length, 1.50 into head. Base of anal 2.25 into base of dorsal. Color in spirits: Head and anterior third of body brown, posterior two-thirds yellowish white (salmon color in life). Caudal yellow. Spinous dorsal brown. Posterior half of soft dorsal and anal fins yellowish white. Ventrals more or less spotted with brown. A deep black spot on first three dorsal spines, another on upper part of first three dorsal rays. A bright black spot on base and in axil of pectoral fins. A big black spot on outer half of first five anal rays. Two specimens. Length 4–6.50 inches. Guam, June, 1900. *Hab.* Seas of India to New Hebrides, Marianas.

GENUS **ANAMPSES** CUVIER.

129. Anampses cœruleopunctatus (Rupp.). **Tatalum.**

Head, from end of opercle flap to tip of snout, 3; depth 3; eye 6.50; interorbital 3.66; D. IX 12; A. III 12; P. 13; V. I 5. Scales 5-28-10. No scales on head. Body oblong, compressed. Branchiostegals 6. Teeth in jaws in one row, the two front ones being prominent, directed forward with compressed cutting edges. Lateral line continuous, bending down for three rows of scales under seventh dorsal ray. Fins: Caudal slightly rounded. Pectorals 1.50 into head. Ventrals 2. Base of anal about equal to head, 2 into base of dorsal. Color in spirits: Brownish, each scale with a round blue spot margined with black. Head unspotted, but with 8–10 blue lines, most of which radiate from the eye, three extend almost vertically down from the orbit. Base of pectorals black, pectorals yellow. Ventrals dusky, the first rays blue. Caudal dusky, with numerous blue spots. Dorsal and anal with two or three rows of spots or lines. One specimen. Length 8 inches. Agaña, Guam, June 14, 1900. *Hab.* Red Sea, east coast of Africa, Mauritius, seas of India, Polynesia, Marianas.

GENUS **CHEILINUS** LACÉPÈDE.

130. Cheilinus trilobatus Lacép. **Gadu.**

Head 2.50; depth 2.66; eye 6.50; interorbital 4.50; D. IX 10; A. III 8; P. 11; V. I 5. Scales 2-22-5. Lateral line interrupted. Head scaled, two rows of scales on the cheeks, three scales in lower row which overlap the lower limb of preopercle. Teeth in a single row, the two anterior teeth in each jaw enlarged canines; no canine tooth at angle of jaws. Lower pharyngeals ⊥shaped, the teeth of the lower limb rounded and in two rows, the middle one the largest. Color in spirits: Greenish, head with whitish (red in life) red stripes and dots, three very distinct oblique lines running from eye down sides of snout. Each scale of body with whitish vertical lines (red in life). The body is indistinctly banded with about five very wide dusky bands, the most distinct ones covering about half of the caudal peduncle. Vertical fins green with whitish margins. Pectorals yellow, ventrals green. One specimen. Length 8 inches. Guam, June 2, 1900. *Hab.* East coast of Africa, China, New Hebrides, Marianas.

131. **Cheilinus fasciatus** (Bl.).

Young: Head 2.60; depth 2.50; eye 4.20; D. ix, 10; A. iii 8; P. 11; V. i 5. Scales 23. Lateral line interrupted. Two rows of scales on the cheeks, the lower row with three scales. Two anterior teeth enlarged, canines; no canine tooth at angle of jaws. Color in spirits: Green, with seven and one-half narrow yellowish cross bands, two incomplete ones on the nape. The third is from the 3–4 dorsal spines to posterior of ventrals; the fourth is from the sixth dorsal spine to mid-way between ventrals and anal; the fifth is from 8–9 dorsal spine to 1–3 anal spine; the sixth is from 3–4 dorsal ray to anal; the sixth and seventh are on the caudal peduncle, the seventh occupying the base of the caudal fin. The thorax and lower half of head and tip of snout are yellowish white (probably red in life). A short black line crosses the opercular flap and base of pectorals. One specimen. Length 3 inches. Agaña, Guam, June 2, 1900. *Hab.* Polynesia, Marianas.

132-134. **Cheilinus nigropinnatus** sp. nov.

Head 2.50; depth 2.55; eye 3.75; snout 3.50, about equal to interorbital; D. ix 10; A. iii 8, the third anal spine the longest; V. i 5; P. 11. Scales 2-22-6. Lateral line interrupted. Teeth in a single row in each jaw, the six anterior ones the largest, curved and projecting. Snout sharp-pointed, mouth protractile. Cheeks with 2 rows of very large scales which entirely cover the whole of preopercle. The scales all over the body are distinctly striated. The tubes of the lateral line are unbranched. Body oblong, slightly compressed. The upper profile from anterior base of dorsal to tip of the pointed snout almost straight and on an angle of 20° with axis of body, its length 2.50 into length of fish exclusive of caudal. Eight rows of scales in front of dorsal. Pharyngeal teeth ⊥shaped with 2 rows of teeth on posterior limb. Fins: Origin of dorsal slightly posterior to origin of ventrals. Base of anal 2 into base of dorsal. Pectorals 2 into head. Ventrals 1.75 into head. Color in spirits: Very light brown (dull red in life), the free portion of tail with a distinct band of yellowish half as wide as eye and margined with dusky around anterior part. Another yellowish band bordered more or less distinctly with dusky just back of eye over the nuchial region to lower edge of opercles. Ventral fins jet black and covering a dusky spot on belly. The three anterior dorsal and anal rays each have a large black spot margined with yellowish. More or less dusky on tip of spinous dorsal; otherwise fins yellowish white. Three specimens. Length 3 inches. Guam, May 25, 1900. *Hab.* Marianas. This species seems to be a connecting form between *Cheilinus* and *Pseudocheilinus*. It is doubtful if the latter genus is well founded. Type of species No. 134 B. P. B. M.

GENUS **CORIS** LACÉPÈDE.

135-136. **Coris pulcherrima** Gunth.

Head 3.55; depth 3.55; eye 6.50; interorbital 5.66; D. IX 12; A. III 12. Scales small, 84 in lateral line Body oblong, compressed. Branchiostegals 6. Teeth in a single row, no posterior canine teeth. Lateral line continuous. Fins: Caudal rounded. Pectorals 1.50 into head. The first dorsal ray elongate. Base of anal much longer than head, 1.50 into base of dorsal. Color in spirits: Dark brown with wash of bluish, blue dots the size of pupil scattered over the body, becoming more numerous on posterior part of fish. A series of blue dots run from eye along the base of dorsal fin. Two broad reddish violet stripes (rather indistinct in specimens before me) on the sides of head, one from tip of snout through eye to flap of opercle, the other just below the orbit from gape to posterior edge of opercle on a line with base of pectorals. There is a dark violet line on the isthmus. The general color of head is a shade lighter with a yellowish wash. Lips yellow. Caudal and pectorals bright yellow. Dorsal and anal yellowish with 2 rows of blue dots and margined with blue. Ventrals yellowish with wash of bluish, the first rays of deep blue. Two specimens. Length 6-8 inches. Agaña, Guam, July 12, 1900. The material at hand will not warrant the writing of *C. pulcherrima* with *C. formosa*. *Hab.* Western Pacific, Polynesia, Hawaiian Islands, Marianas.

137. **Coris aygula** Lacép. **Tatanung.**

Head 3.20; depth 3.20; eye 8.25; interorbital 5; D. IX 12; A. III 12; P. 14; V. I 5. Scales 19-65-5. Lateral line continuous. No scales on the head. Nape of neck with rather prominent hump. Body oblong, compressed. The upper lip is very broad, with folds. Teeth: The two anterior teeth are large, curved canines; no canine tooth at angle of jaws; pharyngeal teeth ⊥shaped, with blunt round teeth in more than 2 rows on lower limb. Fins: Caudal sub-truncate. Pectorals 1.66 into head. Outer ray of ventrals elongate, 1.30 into head. Base of anal 1.66 into base of dorsal. The 2 anterior dorsal spines somewhat elongate. Color in spirits: Blackish, fins seem to be almost uniform with color of body, except there is a wash of bluish green on the pectorals which are margined with yellow. The opercular flap is a very deep blue. One specimen. Length 13 inches. Guam, June 28, 1900. *Hab.* Mauritius, Red Sea, Australia, Marianas.

Genus **HALICHOERES** Ruppell.

138. **Halichoeres hortulanus** Lacép.

Head 3; depth 3; eye 6.50; interorbital 4.66; D. IX 11; A. II 10; P. 14. Scales 3-24-10. Lateral line continuous, but bent abruptly down on posterior part of body. No scales on head, the scales on thorax smaller than those on sides. Teeth: A single row in each jaw, the four anterior ones in each jaw curved canines; the two anterior ones the longest; a single canine at angle of jaws. The pharyngeal teeth are ⊥shaped, with one or two big teeth in middle of lower limb slightly convex, 1.50 into head, same length as pectorals. Base of anal is contained 2.66 into base of dorsal. The first ventral rays prolonged 1.66 into head. Color in spirits: Posterior two-thirds of body a light brown slightly washed with yellowish. Each scale has a square black spot in centre; belly without spots. Head with bluish longitudinal bands, two on the forehead; another extends from shoulder to snout through the upper part of eye; the next is a short line from posterior edge of orbit to shoulder, two short lines on opercle, and the other extends from anterior edge of opercle to the under jaw. The anterior part of back has a series of round bluish spots. Two yellowish spots on the back, the first below 4–5 dorsal spine, the second below the 4–5 dorsal rays; the anterior of these spots is followed by a black splotch larger than the spot. Caudal, anal, ventral and pectoral white, with wash of yellowish. Dorsal fin with brown oblique lines enclosing round spots. Two specimens. Length 1–6 inches. Agaña, Guam, July 14, 1900. *Hab.* Africa to Polynesia, Marianas.

139. **Halichoeres nebulosus** (Cuv. & Val.).

Young: Head 3; depth 3.50; eye 4.20; interorbital 5; D. IX 11; A. III 11; P. 13; V. I 5, the outer rays prolonged. Scales 2-29-9, no scales on head. Lateral line continuous. Scales on thorax smaller than on sides. Body oblong, compressed. Pharyngeal teeth ⊥shaped, the two middle ones on lower limb the largest. Teeth of jaws in single row, the two anterior ones in each jaw the largest, sharp, conical, and projecting forward. A canine tooth at angle of jaws. Fins: Caudal square. Pectorals 1.66 into head, its base 5, its shortest ray 3 into head. Base of anal 1.83 into base of dorsal. Color in spirits: Upper part of body with light and dark blotches and spots. Three or four indistinct short silvery bands on sides of belly covered by the pectorals. A bluish black spot just back of orbit. Opercular lobe dark violet preceded by a silvery spot. About 7 yellowish white spots on the bach, along the base of the dorsal. Head with several reddish violet bands, the outer one extending from gape to the middle of opercle; the one just above it extends from maxillary through lower part of orbit, where it branches, one branch curving down along the posterior margin of the opercle but not forming a complete ring. There are about three yellowish cross bands on top of the head. Dorsal fin with a small black spot between its 1–2 spines and a larger black ocelus between the 2–3 soft rays, and blue-tipped with a yellowish white dark-edged band through the middle. Caudal yellowish. Ventrals and pectorals yellowish white. Three specimens. Length 3 inches. Guam, July 14, 1900. *Hab.* Red Sea, East Indies, Marianas.

140. **Halichoeres opercularis** Gunth.

Young: Head 3; depth 3.50; eye 4; interorbital 5; D. IX 11; A. III 10. Scales 2-29-9. Body oblong, compressed. Color in spirits: Scales of upper half of body have dark brown margins with lighter centres. A series of five or six whitish spots along base of dorsal. A silvery dark-edged band from gape to opercles. A violet spot behind orbit; another larger one edged with dark brown on the extremity of operculum. Lower half of body whitish, with two silvery lines on the sides of abdomen descending obliquely forward. A black spot on dorsal between 1–2 spines; a larger yellow-edged spot between 1–3 dorsal soft rays. Anal white with grayish spots at base. Caudal yellow, tipped with dusky. Two specimens. Length 2 inches. Guam, July 14, 1900. *Hab.* Fiji Islands, Amboyna, Marianas.

141. **Halichoeres leparensis** (Bleek.).

Young: Head 3.30; depth 4.20; eye 4; interorbital 4. Scales 26. Lateral line continuous, no scales on head. Body oblong, compressed. Color in spirits: Faded into almost uniform light olive gray. Dorsal fin with large black spot between 1–2 spines and 1–2 soft rays; also indication of 8–9 minute dark dots along base of dorsal and a small black spot at base of caudal; otherwise fins white. An indication of narrow vertical bands—a brownish white line from behind margin of orbit continued in lighter shade of color to caudal. One specimen, badly faded. Length 1.50 inches. Guam, July 14, 1900. *Hab.* East Indian Archipelago, Marianas.

142. **Halichoeres nigropunctatus** sp. nov.

Head 3.33; depth 3.33; eye 5; interorbital 4, equal to snout; D. IX 11; A. III 11; P. 12; V. I 5. Scales 2-30-9. Lateral line continuous. No scales on head; scales on the thorax smaller than those on the sides. Teeth: A single row, with the four anterior teeth in each jaw enlarged; projecting canines; a canine tooth at the angle of the jaws. The pharyngeal teeth ⊥ shaped, with one very large tooth in the middle of the cross, flanked on each side by two smaller ones, the anterior limb of the ⊥ with about 12 saw-tooth-like teeth. Body oblong, compressed. Fins: The caudal is square; length of its exposed rays on median line equal to longest ray of ventrals, 1.66 into head. Height of caudal peduncle 2 into head. Longest ray of pectorals 1.33 into head, the shortest ray 2.50, the base 4. Base of anal 1.66 into base of dorsal. The last ray of dorsal equal in length to last ray of anal, 2.50 into head. The spinous portion of dorsal fin not so high as soft portion. Color in spirits: Ground color pearl white with a slight wash of pinkish and yellow. The entire body and opercles covered with black spots, larger than the interspaces; in fact, the ground color, except on the back and belly appears as narrow yellowish white reticulations all over the body. These colors, being very sharply defined, give the fish a most striking calico-like appearance. On the back, for a space about two-thirds the width of eye on each side of the dorsal fin the ground color appears without black markings, which gives the appearance of a yellowish band from the snout along the back to caudal fin. This yellowish white of the back is marked by about 9 small indistinct silvery splotches on each side of the dorsal; the last three form short narrow silvery bands over the caudal peduncle; a small silvery line extends down on the snout from the forehead to lips; a pinkish dark-margined stripe half as wide as eye from anterior of orbit to maxillary; a silvery stripe of equal width below it from orbit to gape; below this is another pinkish dark-edged stripe from lower margin of orbit, forming a complete band under chin; a branch of this line encircling a silvery spot on the posterior part of each lower mandible. The remaining markings on sides of head are uniform with markings of the body. Caudal fin yellowish with five dark cross bands. Dorsal with short oblique line alternating with dark lines which fade out on upper part of fin. Anal with 12 round black spots edged with silvery white on its inner half; outer half whitish with faded darker spots; margin of fin blackish. Ventrals with a black spot at base, and two dark cross bands on the ray, the inner one wider and most distinct; outer third of fin yellow. Pectorals yellow. One specimen. Length 4.50 inches. Agaña, Guam, July 2, 1900. *Hab.* Marianas. Type is No. 142. B. P. B. M.

GENUS **JULIS** CUVIER & VALENCIENNES.

143-146. Julis anertensis (Gunth.).

Head 3.50; depth 3.50; eye 5.50; interorbital 4; D. VIII 13; A. II 13. Scales 28. Body oblong, compressed. Snout not produced. Anterior teeth conical. Inferior pharyngeal teeth not confluent or pavement-like. Branchiostegals 6. Fins: Caudal deeply lunate. Length, longest ray equal to head; the shortest ray 2.20 into head. Pectorals 1.25 into head. Ventrals 1.50. Base of anal about 1 into head, 2 into base of dorsal. Color: Head violet with about five oblique or longitudinal lines of greenish with darker edges; three of these lines centre in the orbit. Body greenish, the vertical streak on each scale very indistinct. Pectorals with a broad oblique black band across its posterior half, and with a black spot at the axis. A black spot between second and third dorsal spines; two fine brown lines run the entire lenth of the dorsal, one near the base, the other just above the middle of its height; they are the margins of a broad band of greenish along the middle of the fin. Anal with a similar line running a little above its middle, separating the bluish basal portion from the outer yellowish white. Caudal yellowish white with a yellowish band having fine brown edges along the upper and lower margins of the fin. Six specimens. Length 2.50–7 inches. Guam, July 14, 1900. *Hab.* North coast of Australia, New Hebrides, Norfolk Island, Marianas.

147. **Julis purpurea** (Forsk.).

Head 3.33; depth 3.33; eye 7.50; interorbital 4.33; D. VIII 13; A. II 11; V. I 5. Scales 27. Head entirely naked. Body oblong, slightly compressed. Snout not produced. Branchiostegals 6. Teeth in a single row, two anterior canines in each jaw, no posterior canine. Fins: The caudal is slightly emarginate, the upper and lower rays being slightly produced. Pectorals 1.50. Ventrals about 2. Base of anal equal to length of head, 1.66 into base of dorsal. Color in spirits: Grayish with a wash of green, two broad red bands (faded into whitish) from head to caudal fin; another brownish violet band along the back to the caudal fin, the red lines along the sides send up vertical processes joining each other. A broad red line extends from posterior part of orbit obliquely back, branching into two on the opercle. An orange line on lips and another across snout just above the lips. Top of head purplish. A yellowish line across upper boundary of interorbital. Dorsal fin with upper half pea-green, lower half whitish separated by a dusky line. A black spot between 1–3 spines. Anal with upper half yellowish white, the lower half greenish separated by a dusky line. Pectorals yellow with black tips. Caudal greenish. One specimen—length 8 inches, and 8 young, 2–5 inches. Agaña, Guam, July 14, 1900. *Hab.* Seas of India, Africa, Polynesia, Marianas.

148. **Julis punctatus** sp. nov.

Head 3.25; depth 4; eye 6; interorbital 4.25; D. VIII 13; A. III 10; P. 15; V. I 5. Scales 8-27-2. Head entirely naked. Scales on thorax smaller than on sides. Body oblong, slightly compressed. Teeth in single row, two large canines in each jaw,

no canine at angle of jaws. Fins: Caudal is slightly convex with the angles scarcely prolonged. Pectorals 1.50 into head, its base 4.50; the shortest ray is equal to base. Ventrals short, their longest ray 2.25 into head. Base of anal is contained 1.86 into base of dorsal. The last soft rays of anal and dorsal of equal length, 4 into head. Anterior dorsal spine 5.75. Color in spirits: Ground color whitish with wash of grayish olive. The scales of the back and down to lateral line on sides have dark brown centres. A black spot about size of eye forms a saddle on the caudal peduncle just back of the dorsal fin. The scales of the lateral line are without dark centres. On the sides of the body below the lateral line are two longitudinal rows of alternating dark and white (probably red in life) blotches of about equal size, there being six pairs of dark blotches on each side; these blotches are separated vertically by a row of scales without brown centres. Belly, thorax and chin without markings. Sides of head without definite lines, a yellow dark-edged band over snout. Top of head and upper part of snout with narrow bluish reticulations. Caudal clear yellow (base probably red in life). Dorsal yellow with a dusky blotch between 2–3 dorsal spine. Pectorals yellow with axil dusky. Ventrals yellow. The upper parts of opercles are brownish. One specimen. Length 7 inches. Agaña, Guam, July 14, 1900. *Hab.* Marianas.

GENUS **STETHOJULIS** GUNTHER.

149. **Stethojulis renardi** (Bleek.).

Head 2.83; depth 3.75; eye 6; interorbital 4.25; D. IX 11; A. II 11; P. 14. Scales 10-29-2; no scales on the head; the scales on the thorax as large or larger than those on the sides. Lateral line continuous. Body oblong, compressed. Fins: Base of pectorals slightly above the axis of body, their length 1.50 into head. Ventrals 2.60 into head. Base of anal 2.20 into base of dorsal. Caudal rounded. Color in spirits: Bluish above, white with slight wash of blue below. Body with four longitudinal stripes; the upper, very narrow and indistinct, extends from occiput along base of dorsal fin; the others are yellowish white—the second is from in front of nostrils through upper part of eye to caudal; there is a small black dot above its termination; the third extends from the maxillary, below the eye to a line with posterior edge of base of pectorals; the fourth, so far as can be distinguished, extends up from the isthmus along the gill openings to a little below base of pectorals, whence it curves backwards and ends on a line front of anal. One specimen. Length 4 inches. Agaña, Guam, July 14, 1900. *Hab.* East Indian Archipelago, Marianas.

150. **Stethojulis fulvoventris** sp. nov.

Head 3; depth 3.20; eye 4.75; interorbital 4.20; D. IX 11; A. III 11; P. 15; V. I 5. Scales 2-29-9. Lateral line continuous.

No scales on the head, the scales on the thorax larger than on the sides. Upper lip broad, lower lip double. The pharyngeal teeth ⊥shaped, not pavement-like. Teeth in jaws in single series, the anterior ones (in young) not especially long, a canine tooth at angle of jaws. Body oblong, compressed. Branchiostegals 6. Fins: Caudal is rounded. Pectorals 1.50 into head, base 4.50, shortest ray equal to base. Base of anal 1.86 into base of dorsal. Ventrals 2.33 into head. Color in spirits: Above brownish with purplish wash, each scale with three or four small dots of bluish green, dots thicker and more minute on top of head and upper half of opercle. Sides of body below axis, belly, thorax and chin yellowish white with slight bluish wash; the centre of the scales a shade darker, which gives an indistinct streaked appearance. A yellowish white line, broadest anteriorly, extends from lips across cheeks, just touching lower margin of orbit, and back to caudal, becoming indistinct posteriorly. Just above this line, extending from head to caudal fin, is a narrow dusky line. Two small black dots on each side of caudal peduncle; these dots are margined with blue. Base and axes of pectorals blackish. A curved white line, wide as the pupil, extends from edge of opercle above and around the inside axis of the pectorals. Fins: All whitish, an indistinct indication of bluish dots on dorsal; no black spot on last dorsal ray. Four specimens. Length about 3.50 inches. Agaña, Guam, June 14, 1900. This species is near *S. strigiventer* (Benn.). *Hab.* Marianas. Type specimen 150 B. P. B. M.

GENUS **GOMPHOSUS** LACÉPÈDE.

151-154. **Gomphosus pectoralis** Quoy & Gaim.

Head 2.66; depth 4; eye 7.5; interorbital 6.50; D. VIII 13; A. II 11. Scales 2-29-11. Snout much produced. Body oblong, compressed. Teeth conical, no posterior canines. Fins: Caudal truncate, the outer rays not produced. Pectoral 2 into head, its base equal to length of its shortest ray. Base of anal 1.86 into base of dorsal. Color in spirits: Reddish brown on top of head and body, becoming lighter on belly and whitish on thorax and lower half of head. The scales of body darker at their bases. A dark band from snout through eye—in some specimens two bands may be distinguished behind the eye. A black spot at upper axis of pectorals. Caudal yellow for its posterior half. Dorsal and anal dusky, with a narrow margin of yellow, the anal with a row of transparent spots on its inner half. Pectorals and ventrals yellow. Five specimens. Length 3–5.50 inches. Guam, June 19, 1900. *Hab.* Mauritius to Malay Archipelago, Marianas.

155-156. **Gomphosus tricolor** Quoy & Gaim. **Loro.**

Head 2.50; depth 4.20; eye 10.5; interorbitals 7; distance from anterior of orbit to tip of snout 1.86 into head; D. VIII 13; A. II 11.

Scales 2-26-8. Body oblong, elevated, compressed. Snout very much produced. Anterior teeth conical, no posterior canines. Branchiostegals 6. Fins: Caudal with its outer rays rather produced. Pectorals 2 into head. Base of anal 2 into base of dorsal. Color in spirits: Deep bluish, a yellow splotch extending from lower part of pectoral axis to a little above a lateral line on the shoulders; this splotch is as wide as the orbit. Pectorals dusky with a deep blue band across posterior third. Dorsal and anal fins yellowish, without markings of any kind. The caudal is yellow, with the three outer rays on each margin bluish green. Ventrals greenish. Two specimens. Length 10 inches. Guam, June 14, 1900. *Hab.* East Indian seas, west part of Pacific, Marianas, Hawaiian Islands.

157. **Gomphosus pacificus** sp. nov.

Head 2.50; depth 4; eye 7.5; interorbital 6; D. VIII 13; A. III 11. Scales 2-27-9, the tubes of the lateral line much branched. Body oblong, compressed, the snout much produced. Teeth small, conical; no posterior canine teeth. Branchiostegals 6. Height of caudal peduncle 3 into head. Fins: Caudal truncate. Pectorals are half as long as head, their base 6 into head, and their shortest fin ray is one-half the length of the longest ray. The base of anal is contained 2.55 times into base of dorsal. Ventrals short, about 3 into head. Color in spirits: Head, including lower part, back, caudal peduncle and sides a sepia brown, the scales with a black spot at base. The thorax and belly is lighter, being a bistre, without the dark spot at base of scales. A narrow, indistinct whitish line half as wide as eye in axis of pectorals and extending two rows of scales above the base of the fin. The pectorals are brown, with a broad indistinct white band across their outer half, the base of the fin black. Ventrals yellowish white, with outer rays reddish brown. Posterior half of caudal yellowish. The inner half of dorsal and anal is dark greenish, while the outer half is yellowish white. One specimen. Length 6.20 inches. Guam, June 14, 1900. This species is probably more nearly related to *G. pectoralis* than any other described form, but it differs markedly in having the under chin sepia brown instead of white, in having a whitish band on the pectorals, in the different length of the base of anal fin into base of dorsal, and in having a whitish line behind the pectorals; also in the different markings of the dorsal and anal fins. *Hab.* Marianas. Type is No. 157 B. P. B. M.

GENUS **CHEILIO** LACÉPÈDE.

158. **Cheilio inermis** Bl.

Head 3; depth 7; eye 5.66; maxillary 4.20; mandible 2.59; interorbital 4 into length of snout; D. IX 14; A. III 12. Scales 50. Body elongated and nearly cylindrical, mouth more or less protractile. Teeth in a single row, the two anterior teeth in each jaw the largest, no posterior canines. Fins: Caudal slightly rounded. Pectorals 2.20 into head. Base of anal 1.40 into base of dorsal. Ventrals small, 1.50 into snout. Color in spirits: Brown, with a slight wash of reddish; lower parts white, a dark line along sides from caudal to eye. Caudal brownish. Dorsal, pectorals and ventrals whitish. Anal whitish, with short oblique lines and dots of pale bluish. The margin of the fin is dusky. One specimen. Length 8 inches. Guam, June 2, 1900. *Hab.* Red Sea, seas of India, Polynesia, Marianas.

FAMILY **SCARIDÆ**.—PARROT-FISHES.

GENUS **SCARUS** FORSKÅL.

466. **Scarus celebricus** (Bl.).

Head 2.66; depth 3; eye 8.50; interorbital about 3; D. IX 11; A. II 8; V. I 5; P. 15. Scales 2-23-6. Body oblong, oval. Jaws large, very convex, the upper slightly projecting. Anterior teeth soldered together; a conical tooth at the angle of the upper jaw. Upper lip narrow, not covering half the upper jaw. Scales very large, cycloid; lateral line interrupted; two rows of scales on cheeks, no scales on lower limb of preopercle. Fins: The first dorsal spine is the shortest, its length about equal to diameter of eye. Caudal is almost square. Pectorals 1.50 into head. Ventrals smaller, about 2 into head. Base of anal equal to length of pectorals, about 2 into base of dorsal. Color in spirits: The teeth are a faded bluish green, with cutting edges white. The general color of the fish is a dusky greenish. A line, probably red in life, passes longitudinally through or behind the eye; these lines, and indeed all the distinctive colorings, are badly faded. The caudal peduncle seems to be lighter in color. The fins have faded so the markings are not distinguishable, although evidently made up of two colors, probably red and green. One specimen. Length 8 inches. Agaña, Guam, July, 1900. *Hab.* China Seas, Western Pacific, Marianas.

160. **Scarus cypho** sp. nov.

Head 3; depth 3.20; eye 6; interorbitals 3.50; D. IX 10; A. III 9; P. 14. Scales 2-24-6, lateral line interrupted, the tubes branched. Two rows of scales on the cheeks, with five scales in lower row; the opercular limb is entirely bare. Pharyngeal teeth pavement-like, about twice as long as wide, the anterior ones the longest. Teeth in jaws quite projecting, their length equal to orbit; two canine teeth at angles of upper jaw. Body oblong, compressed; the upper profile of back quite convex. The snout is much produced. The lips are rather narrow, scarcely covering one-half the jaws. Fins: The caudal is lunate. The pectorals 1.33 into head, their base 5, their shortest ray 4. Ventrals 1.50. Base of anal 1.50 into head, 2.83 into base of dorsal. The dorsal has 4 series of scales in front of it and four behind it, its base is convex, its posterior rays are the longest, being about 3 into head. Color in spirits: A uniform light green, a darker blotch extending over top of head and upper part of opercles. Teeth greenish at base with white margins. Lips a brighter green with wash of yellowish, a narrow black line near their margins. Fins greenish, dorsal with narrow intermarginal line of black. Anal with broad edge of brighter green, a narrow black line through its outer third, inner two-thirds white with wash of green. Ventrals white with slight greenish wash. Caudal green, lighter in centre, with dusky intermarginal line. One specimen. Length 9.5 inches. Agaña, Guam, July 12, 1900. This species is characterized by the five scales in lower row on cheeks, its convex back, projecting snout, elongated dorsal fins, and rather narrow lips. Its coloring is similar, in spirits, to *P. bataviensis*, Bl. *Hab.* Marianas. Type is No. 160, B. P. B. M.

GENUS **PSEUDOSCARUS** BLEEKER.

161. **Pseudoscarus bataviensis** (Bl.).

Head 3.25; depth 3.25; eye 6.25; interorbital 3.20; D. IX 10; A. III 9; P. 14. Scales 2-23-5. Two rows of scales on the cheeks, the lowest with six scales. The lips are broad, almost covering the upper teeth. A conical tooth at angle of jaws. The preopercular limb is entirely bare. Body oblong, compressed. The upper profile of back, from shoulders to middle of soft dorsal, straight. Snout short, blunt; length from anterior edge of orbit to tip of teeth 2.66 into head. Fins: Caudal is lunate, the outer rays being about one-third longer than middle ray. Pectoral ray 1.20 into head. Ventrals 1.50. Base of anal 1.50 into head, 2.50 into base of dorsal. Color in spirits: Greenish, more or less dusky on upper opercles and shoulders. Teeth whitish. Fins greenish, the caudal yellow in the middle, the tip black. Dorsal with dusky margin. Outer third of anal green, a black line through the middle, the inner two thirds being greenish white. Ventrals with a wash of yellow. One specimen. Length 9 inches. Agaña, Guam, July 12, 1900. *Hab.* Batavia, Marianas.

162. **Pseudoscarus platodoni** sp. nov.

Head 2.66; depth 3.25; eye 6.50; interorbital 3.25; D. IX 10; A. II 9; V. I 5; P. 14. Scales 2-23-5, the lateral line interrupted. Two rows of scales on cheek, no scales on lower limb of opercle. Lips rather narrow, scarcely covering half the jaws. Body oblong, slightly compressed. Snout very blunt; from the interorbital to the posterior edge of upper teeth the profile is straight; the length of the upper front teeth being slightly greater than eye; no posterior canine tooth. There are 4 rows of scales in front of dorsal. The distance from anterior edge of orbit to tip of teeth is 2.50 into head. Fins: The caudal is slightly rounded, its length 1.66 into head. The longest ray of pectoral is 1.50 into head, its base 4.50. Base of anal is 1.50 into head, 2.25 into base of dorsal. The ventrals are short, about 2 into head—about equal to longest dorsal spine. Color in spirits: Olive brown, the scales covered with slightly darker centres. All the fins, with the exception of the pectorals, are black. Pectorals yellowish white, teeth yellowish white, chin whitish, iris yellowish. The young are similarly colored. Two specimens. Length 3-6 inches. Agaña, Guam, July 14, 1900. This species is chiefly characterized by the very broad yellowish teeth, which give the snout a very blunt—almost square—tip; by the narrow lip, and the uniform coloring of the body. *Hab.* Marianas. Type No. 162 B. P. B. M.

163. **Pseudoscarus sumbawensis** Bl.

Head 3; depth 3; eye 5.50; interorbital 3.25; D. IX 10; A. II 9; V. I 5; P. 14. Scales 2-24-5. Body oblong, compressed. Upper jaw slightly the longer. A sharp canine tooth at angle of upper jaws. Two rows of scales on cheek. The lower preopercular limb is naked. Upper lip very broad, almost covering the upper teeth. The pharyngeal teeth pavement-like, their width 2 into their length. Lateral line is interrupted. Fins: Caudal is emarginate, with angles produced. Pectorals 1.25 into head. Ventrals 1.25. Base of anal 1.50 into head, 2.50 into base of dorsal. Color in spirits: Violet-olive. Dorsal, anal and caudal fins darker. Ventrals and pectorals yellowish. Two specimens. Length 3-7 inches. Guam, July, 1900. *Hab.* Marianas.

FAMILY **CHÆTODONTIDÆ**.—CORAL-FISHES.

GENUS **CHÆTODON** (ARTEDI) LINNÆUS.

164-168. **Chætodon ephippium** Cuv. & Val.

Head 3.88; depth 1.66; eye 3.50; interorbital 4; D. XIII 23; A. III 22; V. I 5. Scales 9-37-14. Body elevated and strongly compressed. The snout rather produced, the lower jaw longer. Lower edge of the preopercle slightly serrated. Branchiostegals 6. Teeth setiform. Fins: Dorsal spines are of moderate strength, the longest spine 2 into head. Posterior part of dorsal and anal rounded, the soft dorsal has a short projecting filament. Caudal square, the longest ray 1.50 into head. Color in spirits: Yellowish white with about 9 indistinct brownish longitudinal lines, half as wide as iris, below the axis. A big black patch broadly edged with white anteriorly occupies all the upper posterior part of the fish, including most of the dorsal fin. Posterior edge of the dorsal yellow, followed by a narrow black line and terminally tipped with white.

A short and narrow but perfectly distinct ocular band of black extends through the eye and to about the width of the eye above and below the orbit. A short vertical line extends up from the base of the pectorals just behind the posterior edge of the opercles. Another narrow black line beginning at the base of the fourth dorsal spine extends obliquely downward and forward to near the base of the pectorals. Ventrals, pectorals, anal and caudal fins white. Tip of snout yellow. Iris yellow, invaded by the black ocular band. Four specimens, 3–4 inches in length, were secured inside the coral reef, Agaña, Guam, July 14, 1900. *Hab.* Western Pacific, Polynesia, Marianas.

169-171. **Chætodon satifer** Bl.

Head 3; depth 1.50; eye 3.50 into head; D. XIII 24; A. III 20. Scales rather large, about 35 in lateral line. Teeth setiform, the jaws rather projecting, the under one slightly the longer. A black ocular band, indistinct and narrow above the eyes; below it is distinct, slightly wider than eye and edged anteriorly with white. Color: Whitish; the posterior part, including caudal peduncle and fin, all of soft dorsal, and a broad edge to anal, a bright yellow. Body with about five darkish hypo-dermal bands passing backwards and upwards on the upper anterior third of body, and about ten passing downward and backward on posterior two-thirds of body. Top of dorsal behind the fifth ray with a round black white-edged spot. The soft dorsal is narrowly edged with black, and has a fine filament from upper posterior part. Soft anal and the caudal with a narrow submarginal line of black, the margin white. On the upper posterior third of the body two or three of the spaces between the black lines are colored yellow, which gives the appearance of there being three yellow lines angularly bent with the angle pointing forward on that part of the body. There are about five bright yellow lines on the forehead, between and above the eyes. The young specimen before me has the upper posterior third of body dusky; descending from the posterior part of this dusky patch is a rather indistinct blackish line extending into the soft anal fin where it forms an acute angle and extends forward. There is a very slight indication of this marking in the larger specimens. Three specimens, length 4–5 inches, were caught inside the reef. Guam, July 14, 1900. *Hab.* From the Red Sea through all the Indian Seas to Polynesia, Marianas.

172. **Chætodon citrinellus** (Brouss.).

Head 3.50; depth 1.75; eye 3.13 into head; D. XIV 21; A. III 17. Scales 6-40-14. Color: Yellowish with round bluish spots in the skin under the translucent scales, these spots forming more or less distinct, slightly oblique lines from head to tail, less distinct posteriorly. A black ocular band edged with yellow from base of spinous dorsal through eye to isthmus. Tip of snout black. Fins: Anal tipped with a black band, almost as wide as ocular band. This black band on anal is edged inwardly with a bright yellow band of about equal width. Pectorals, ventrals, caudal and dorsal white, the dorsal narrowly edged with dusky. The dorsal and anal forming an acute angle posteriorly. A series of four specimens were secured inside the coral reef, Agaña, Guam, July 9, 1900. These range in length from 3–3.75 inches. *Hab.* Polynesia, Molucca Sea, Marianas.

173. Chætodon collaris Bl.

Head 3.50; depth 1.20; eye 2.75 into head; snout obtuse, about equal in length to diameter of eye; preopercle slightly serrated; D. XII 26; A. III 21. Scales 5-45-22. Fins: The pectorals and spinous dorsal are white; the ventrals and anal are black; the caudal is white with two black lines and one yellow line near the end; the dorsal is grayish with a bright yellow line near edge of soft dorsal—this fin also has a minute subterminal line of black. The posterior part of dorsal and anal are sharply rounded, the general outline forming an acute angle. The caudal peduncle is black. Color in spirits: The general color is a blackish olive with irregular rows of longitudinal or oblique lines of yellowish round dots showing through each scale. This coloring extends from the black belly and anal fin up to the lateral line. In the specimen before me the lateral line is made very conspicuous by having five or six rows of the round yellow dots running parallel with it. It is very noticeable that these color dots are not so bright a yellow on the upper half as on the lower part of the body; the fading, however, is gradual. There is a broad black ocular band wider than the eye and edged with bright yellow, except on upper third; this black band extends to and embraces the ventrals. All the front part of head is black or dark brown, with a bright yellow line which forms the anterior border of ocular band, extending vertically down from the front edge of one orbit, under chin, to the other orbit. The interorbital space is slightly lighter brown and is indistinctly surrounded by pale yellowish lines, the upper one of which forms the upper anterior border of the black ocular band. From base of pectorals to base of ventrals and forward to ocular band there is a bright yellow area; above this and just back of ocular band there is a grayish area or band wider than the ocular band. This grayish color embraces all the dorsal fin and extends down to the lateral line. Variations: In the "Fische d. Sudsee" this species is figured as having the grayish coloring extending more than half-way down the sides with an abrupt whitish line (gray area in my specimen) between this color and the ocular band. In "Fishes of India" this species is figured with a narrow "bluish white" band just posterior to ocular band, and all the color dots run in a marked oblique direction, and apparently there is no difference in the coloring on the sides of the fish. Day's figure also shows an additional yellow ring around the snout. Four specimens were secured. Length about 2-4 inches. Guam, July 14, 1900. *Hab.* Seas of India to the Malay Archipelago, Marianas.

174. **Chætodon ornatissimus** (Solander).

Young: Head 3; depth 1.36; eye 2.50 into head; D. XII 24; A. III 23. Scales in lateral line 55. The snout is but slightly pointed and shorter than diameter of the eye. Fins: Ventrals and caudal yellow, the latter with black cross band in middle. Pectorals white, about equal in length to ventrals. Posterior edge of soft dorsal and anal yellow with black tips. Color: Yellowish white with seven dusky yellow oblique bands, about half as wide as orbit, extending backward and upward along sides of the body. A black band along the division of opercle and preopercle. A black ocular band, equal in width to iris, extends through the eye and around head; it is widest on forehead. Interorbital space black. A black line around snout and chin. Lower jaw black. Two specimens were secured inside the coral reef of Guam, June 9, 1900. Length 1.75 inches. *Hab.* From the Molucca Sea to Polynesia, Marianas.

175. **Chætodon lunula** Lacép.

Head about 3; depth 1.50; eye 3.50 into head, 1.20 into snout; D. XII 24; A. III 18. Snout slightly produced. Teeth setiform. Fins: Yellowish, white in spirits. Scales in lateral line 42. Color: A black ocular band, broader than eye, crossing the interorbital space and extending to branchiostegals. Head behind this band is white. Snout and throat yellowish white, white in spirits. Bordering on the white band on back of head is a triangular black area extending back to base of fifth dorsal spine; three oblique yellow lines extend across this black area up and backwards towards the dorsal, the lower one forming the lower border of the black area. About the seventh dorsal spine a black line begins, which widens and extends along the base of soft dorsal, forming a band on caudal peduncle. This black band on caudal peduncle is bordered front and rear with yellow. The remaining surface of fish is yellowish, slightly dusky above, with about fourteen indistinct dusky, oblique, epidermal lines on the sides extending upward and back. Caudal fin almost square, broadly white-tipped, with a fine sub-terminal curved line of black. In specimens preserved in spirits the yellow coloring all fades into white. Variations: The young have a black spot with white rim on the soft dorsal. In "Fishes d. Sudsee" this species is figured as having the ocular band extending down to the margin of the preopercle. It is so described by Day in "Fishes of India". Thus differing from the Guam specimens which have the ocular band extending to the branchiostegals. The Guam form also has more dusky on the upper part of body. Two specimens, length about 2.50 inches, were secured inside the coral reef near Agaña, Guam, July, 1900. *Hab.* Seas of India, Andaman Island to Malay Archipelago, Polynesia, Marianas.

176. **Chætodon fulcula** Bloch.

Head 3; depth about 1.50; eye 3.75 into length of head; D. XII 26; A. III 23. Snout rather produced, longer than diameter of eye. Scales 6-29-16. The black ocular band beginning at a distance equal to the length of the first dorsal spine anterior of the base of dorsal fin, and extending through the eye to isthmus, the lower part broadest. Teeth setiform. Fins: Posterior of dorsal and anal rounded. Dorsal spines stout and slightly curved; the median ones are longest. Caudal square, pectorals and ventrals are about equal length. Color whitish with two dusky bands about as wide as the length of caudal fin. These black bands extend from the dorsal to half-way down the sides of the fish, where they end indistinctly; the first from 1–5 spinous dorsal, the second from 8–12 spinous dorsal. Posterior of this last black line the color is a bright yellow, including all the soft dorsal, caudal and anal. The caudal peduncle has a round black spot near the middle. The caudal has a narrow black intermarginal band of white; the soft anal has two. There are about 19 subcutaneous, narrow, blackish, oblique lines passing down the body. Variations: This species is undoubtedly subject to a large amount of variation. In Garrett's "Fisches d. Sudsee" the two dark vertical bands from the dorsal are conjoined superiorly and extend so far as the fourth dorsal spine, and end sharply on about the middle of the sides, *i. e.*, on a line with snout and middle of caudal peduncle. And the body bands sometimes have white edges. In Day's "Fishes of India" these black bands are less wide and extend only to about the lateral line, while the caudal peduncle has a complete black band. Only one specimen was secured. Length 4.50 inches. Coral reef, Guam, May 29, 1900. *Hab.* Sea of Batoe, Seas of India to Malay Archipelago, Marianas.

177. **Chætodon strigangulus** (Solander). **Sea Butterfly.**

Head 3.20; depth 1.75; eye 3 into length of head; D. XIV 15; A. III 18. Scales 26 in the lateral line. Fins: Pectorals, ventrals, anal and dorsal white; the latter two tinged with yellowish and tipped with black. Caudal black, tipped with white, through which runs a fine black line. Mouth small, teeth minute. Color: Body whitish with about twenty-five black stripes angularly bent, with the angle pointing forward. A black ocular band, edged with white, not quite so broad as eye. One specimen, 4.50 inches in length, was secured inside the reef. Guam, July 14, 1900. *Hab.* From the Red Sea to Polynesia, Marianas.

178. **Chætodon trifasciatis** Quoy & Gaim.

Head 3; depth 1.75; eye 3.50, 1 into snout; interorbital 2.75; D. XIV 17; A. IV 16; V. I 5. Scales 9-37-14. Body moderately elevated and strongly compressed. The snout rather sharp-pointed. Lower edge of preopercle serrated. Branchiostegals 6. Teeth setiform. The dorsal spines are of moderate strength, the longest spine 1.75 into head. Pectorals and ventrals of about equal length, 1.60 into head. Color in spirits: Yellowish white, with about 15 rather indistinct oblique dusky lines, angularly bent, with the angle directed forward. The black ocular band edged with white of about the same width as eye, extends from the neck to chest, forming a complete ring. A black band, slightly wider than eye, covers all the soft dorsal and extends down to posterior part of soft anal; this band is anteriorly margined with white. The fins are white, the caudal with a wash of yellow, a narrow black line near the middle. Only one specimen, 2 inches in length, was taken. Guam, July 14, 1900. This species is well figured in Freycinet, "Voy. Uranie," Zool., Pl. 62, Fig. 6. *Hab.* Polynesia, Marianas.

GENUS **HENIOCHUS** CUVIER & VALENCIENNES.

179-180. **Heniochus chrysostoma** (Solander).

Head 3; depth 1.40; D. XII 23; A. II 18; eye 2.75. Scales small, about 67 in the curved lateral line. Fins: Dorsal with fourth spine elongated into a filament almost as long as depth of fish. Pectorals white, reaching to middle of black band on body. Ventrals black, reaching to base of anal. Caudal square, white with dusky spot at base. Soft dorsal white, soft anal mostly black. The snout is short and sharp-pointed, mouth small, teeth villiform in jaws. Color: Yellowish white, with three broad oblique bands of black. The first black band extends from the front of orbit and near first dorsal spine, obliquely down to base of ventral fins and near to anus; the second black band extends from the 3–7 dorsal spines to third and the last soft rays of anal; the third black band extends from about the ninth dorsal spine along the base of soft dorsal to the base of caudal. Snout dusky. Length 3.50 inches. Several specimens were taken inside the coral reef, near Agaña, Guam, July, 1900. *Hab.* Indian Archipelago, Polynesia, Marianas.

FAMILY **ZANCLIDÆ**.—MOORISH IDOLS.

GENUS **ZANCLUS** CUVIER & VALENCIENNES.

181-188. **Zanclus canescens** (Linn.). **Ababang. Butterfly-fish.**

Head 2.45; depth about the same as length; eye 2.50 into snout; D. VII 37; A. III 35. A frontal horn above each orbit in adult specimens. Snout produced, teeth slender and brush-like, much projected. The anterior rays of dorsal and anal elongated. First and second dorsal spines very short; the third greatly produced, ending in a filament about as long as the fish. Pectorals about equal in length to the ventrals. Caudal peduncle unarmed. Fins: Caudal lunate. Pectorals about equal to length of snout. Ventrals (including filament) about the same length as anal. Colors: Yellowish white with three broad, dark, vertical bands, the anterior one forming a somewhat oblique line with anterior of orbit to second dorsal spine, and extending to midway between pectorals and anal; the second extends from the bases of 5–25 anal rays to about 8–23 dorsal rays; this dark band broadens out on the anal fin, while on the dorsal it contracts to a point; there is also a narrow line of white in the posterior part of this dark band; the third dark band includes the base of caudal peduncle and about all of caudal fin. The anterior one of these broad black bands is traversed by two more or less distinct narrow blue lines; in larger specimens these are almost obsolete, excepting the line which extends from anterior base of pectorals to the gill openings. A dusky stripe extends from the ∧shaped narrow blue line above and on a line with the middle of orbit to the tip of the snout; half-way between orbit and tip of snout a black line branches off on each side from this dusky frontal band, and unites with two other dark lines given off near the premaxillary, to form a right-angle triangle on each side of the snout. Lower jaw mostly black. Eight specimens, from 2.75–5.25 inches in length, were secured inside the coral reef. Agaña, Guam, July 15, 1900. *Hab.* This is a common and wide-ranging form extending from East Indies and Polynesian islands to Revillagigedo Archipelago on the east to western Pacific, Marianas.

190. Holacanthus cyanotis Günth. Ugupa Amrilla.

Head, exclusive of flap, 4; depth 1.86; eye 3.50; the preopercle spine smooth, slightly curved, reaching to base of pectorals, 2 into head; interorbital equal to eye; snout 2 into head; D. XIV 15; A. III 16; V. I 5. Scales 48. Preopercle serrated, the strong spine at its lower angle directed back. Teeth setiform. Branchiostegals 6. Scales small, and mixed with these are many minute ones. Body elevated and strongly compressed. Fins: Caudal rounded. The spinous dorsal commences above the opercles. The pectorals and ventrals each equal to length of head. Soft dorsal and anal sub-angular posteriorly. Color in life: Yellow; a fine blue ring around the eye and across interorbital; a blue line, as wide as pupil, down the posterior edge of opercle. Fins yellow; dorsal, caudal and anal with a fine marginal line of deep bluish black. In spirits the color fades into a uniform yellowish white with a blue line around eye and down posterior margin of opercle; caudal, soft dorsal and anal with a fine marginal line of black. Two specimens. Length 5 inches. Guam, June 14, 1900. *Hab.* Polynesia, Marianas.

GENUS **HOLACANTHUS** LACÉPÈDE.

191. **Holacanthus imperator** (Block.).

Head 4; depth 1.75; eye 3.36, about equal to width of interorbital space; D. XIV 20; A. III 19. Preopercle serrated and armed with a spine which in adults is almost a third longer than width of opercle. Teeth setiform in closely set rows. Fins: The dorsal spines short, the longest about equal in length to the base of pectorals. Posterior of anal, dorsal and caudal rounded. All the fins black, except the caudal which is yellowish. The vertical edge of dorsal is also tipped with yellowish. The anal is edged with a narrow line of blue, and a blue line runs out on the spine of the ventrals. Color dusky blue, with about 14 yellowish lines passing obliquely upward to the dorsal, or horizontally to the caudal, or the anal; these stripes are about one-fourth as wide as the interorbital space, and the ones passing to the dorsal are most oblique. A large black descending band, with a blue anterior edge, on the shoulder. Another black band of almost equal width, and edged all around with blue, occupies the interorbital space, passes over eyes and comes to a sharp point on the preopercle just above the spine. The opercle is yellowish brown with the above mentioned blue lines bordering it fore and aft. Length about 6 inches. Specimens were secured inside the coral reef near Agaña, Guam, June 14, 1900. *Hab.* East coast of Africa, through seas of India to Malay Archipelago, Marianas.

192. **Holacanthus marianas** sp. nov.

Head 3.50; depth 1.50; eye 2.75; maxillary 3.50; interorbital 3.20; D. XIV 20; A. III 19; V. I 5. Scales very small, feeling velvety to the touch. Body elevated and compressed. Head with moderately rounded profile, the snout but slightly projecting. Teeth setiform. Branchiostegals 6. Pseudobranchiæ well developed. Preopercle serrated, with a spine on lower part equal in length to the width of the opercle; this spine contained 3.50 times into head. Fins: Dorsal spines of moderate strength, the longest spine 2 into head. Posterior of dorsal and anal rounded. Caudal 1.16 into head, its posterior margin rounded. Pectorals the same length as head, the width of base 3. Ventrals with second ray produced into a short filament. Color in spirits: Bluish black, with about 13 more or less complete yellowish lines; the anterior of these lines, beginning at the base of the eighth dorsal spine, curves forward forming a margin of the jet black area ot shoulders and then curves back to the anal opening; the remaining yellow lines above the axis are almost horizontal; the lines below the axis are very oblique, extending downward and back. Three of the lines on the axis are incomplete, being shorter than the head. There is a black area, the width of the eye, on the shoulders forming a line slightly above the eye to the pectoral fins; this area is bounded anteriorly by a blue line which extends down the middle and lower edge of the opercle. A black area, margined with blue lines across the forehead and over eyes like a mask; this black area, however, does not extend down on preopercles, as in *H. imperator*, but the blue borders unite directly behind the eye and send a vertical blue line down to the base of the opercular spine. Four narrow oblique blue lines on the thorax, and also a short blue cross line just back of isthmus. Anterior of these are blue lines running from near the base of opercular spine to the tip of the first ventral ray. A blue line over the nape midway between first dorsal spine and black area of forehead. Spinous dorsal and anal yellowish white; soft dorsal blackish, the yellowish body lines forming a few reticulations in the posterior part of the fin. Pectorals, ventrals and anal blackish, the anal narrowly margined with blue, and with about three blue lines running through it, forming reticulations in posterior part. This species is closely related to *H. imperator* (Bloch.), but differs markedly from specimens of that species before me in the shorter head and shorter preopercular spine, and the almost entirely different markings of the body. One specimen. Length 4.50 inches. This species was taken inside the coral reef, Agaña, Guam, July 14, 1900. Type specimen is No. 193 in the B. P. B. M. *Hab.* Marianas.

193. Holacanthus nicobariensis Bl.

Head 3.50; depth 1.50; D. XIV 20; A. III 19; eye 3.5 into head, same as width of interorbital space. Preopercle serrated and armed with a spine which is equal in length to the width of the operculum. Teeth brush-like, much produced. Snout concave. Fins: The posterior part of dorsal, anal and the caudal rounded; dorsal continuous. Pectorals 1.16 into length of head, their bases black crossed by one crooked blue line. Ventrals I 5, the first ray produced into a short filament. Color: Black with curved, concentric alternating white and blue lines; four of these white lines are especially wide and distinct, *i. e.*, one running obliquely forward just posterior to the eye—this touches the base of the preopercle spine and runs out on the spines of the ventrals. The second crosses the vent, curves up along sides of body, runs along the base of the dorsal and ends in reticulations on the posterior part of this fin. The third strongly marked white line extends in a deep crescent from posterior base of dorsal to posterior base of anal fin. The fourth and broadest line forms a complete circle around a short straight white line just anterior of caudal peduncle. In addition to these heavy white lines there is a lighter white line midway between each of them, and on each side of these narrow white lines and midway between them and the heavy white lines, are narrow concentric lines of blue. So, for example, beginning with the heavy white line which crosses the vent, we have first the heavy white line; second, a narrow blue line; third, the light white line; fourth, a narrow blue line; and fifth, the heavy white line again. This is the uniform pattern of the fish; however, the blue lines may be more or less irregular, and between the two posterior heavy white lines they are incomplete, the last one being reprerented merely by three blue dots. There is a white cross band on the forehead with a narrow blue line above it. A white spot between nostrils. A bluish line running vertically down the cheeks makes an acute angle in front of eye and extends down the snout. A short blue line from gape to branchiostegals. Reticulations of bluish white on posterior part of dorsal and anal. Caudal dusky, with two white bands at base, and two irregular white bands on caudal peduncle. Length 4.50 inches. Specimens taken agree perfectly with Garrett's figure, "Fisches d. Sudsee," p. 41. *Hab.* Seas of India to Malay Archipelago and beyond, Red Sea, east coast of Africa, Marianas. My specimens were secured among the coral reefs of Guam, May 25, 1900.

194. **Holacanthus bishopi**[5] sp. nov.

Head 3.66; depth 1.66; eye 2.50, 1 into snout; interorbital 3 into head; D. XIV 19; A. III 21; V. I 5. Scales minute and feel like velvet to the hand. Body elevated, strongly compressed; the snout not produced. Hind margin of preopercle finely serrated, the spine equal in length to diameter of eye. Branchiostegals 6. Pseudobranchiæ present, teeth setiform. Fins: Dorsal spines rather short, the first spine 3.66 into head, the second about as long again. The pectorals are the same length as head, their bases 2.50 into head and equal to preopercular spine; the first ray of pectoral prolonged into a small filament, length 3 into total length of fish. The hind margin of dorsal, caudal and anal rounded. Color in spirits: Black with about 8 concentric bluish white lines, alternately rather wide and very narrow as follows: First, as wide as pupil, forms a circle around snout and anterior edge of preopercle; second, encircles nape, passes just in front of preopercle spine, extends obliquely back on thorax and out on the first ray of ventrals; third, a narrow stripe forms a circle just in front of dorsal spine, crosses base of pectorals and around the belly just back of the ventrals; fourth, a wide line forms reticulations on soft dorsal, curves forward to almost a line with pectorals and then encircles belly at the vent; fifth, a narrow line extends from soft dorsal, forms a half-circle and ends in reticulations on posterior of anal fin; sixth, a wide line extends as a circle from posterior edge of dorsal to posterior edge of anal; seventh, a narrow incomplete half-circle; eighth, a wide line forms a complete circle just in front of caudal peduncle. In addition to these markings there is a narrow blue line extending perpendicularly down from front of eye to edge of opercle; another across the interorbital space, and another between the nostrils. A simple reticulation of blue lines on the base of caudal fin. The fins are all dark, the caudal with a slight wash of yellowish. This species differs from the *H. nicobarensis*, Bl., before me in its shorter head, longer spine, larger eye, and additional soft dorsal ray, one less anal ray, and the markedly different arrangement and number of the body markings. Length of specimen 3.50 inches. Agaña, Guam, July 14, 1900. Type specimen is No. 194, B. P. B. M. *Hab.* Marianas.

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[5] Named in honor of Charles R. Bishop, founder of the Bernice Pauahi Bishop Museum

FAMILY **TEUTHIDIDÆ.**—SURGEON-FISHES.

GENUS **TEUTHIS** LINNÆUS.

195. **Teuthis olivaceus** Bl.

Head 3.50, the profile rounded—the snout, however, is straight; depth 2; eye 3.20 into head; D. IX 24; A. III 22; V. I 5. Scales minute, ctenoid, about 20 between lateral line and dorsal. Teeth: Sixteen broad flat teeth in the upper jaw, dentate at extremity; about 14 in lower. Color: Dark brown; extending longitudinally backwards from the upper articulation of the opercle is a bright cadmium orange line (bluish in spirits), about equal in length to the snout, and half as wide as the interorbital space. This blue line is surrounded by a black zone of about the same width. There is a blue splotch just posterior to base of pectoral fins; this splotch is completely hidden by the pectorals when they are pressed against the sides of the body. The general color of fins is brown. The pectorals are broadly edged posteriorly with bluish white. The ventrals have a trace of blue. The caudal fin is deeply lunate, the upper lobe the longer; color entirely black, except the soft rays of the middle, which have a broad subterminal band of white, with a narrow terminal line of black. Caudal peduncle entirely brown, with one movable spine which is equal in length to the width of the eye. The pectoral fin is equal in length to the head. The ventrals are considerably shorter. The posterior edge of dorsal and anal form acute angles. One specimen, length 6 inches, was secured inside the coral reef, Agaña, Guam, July 15, 1900. *Hab.* Polynesia, Marianas.

196. **Teuthis mata** Cuv. & Val.

Head 3.50; depth 1.88; eye 3.50, 2 into snout; interorbital 3 into head; D. IX 26; A. III 25; V. I 5; P. 16. Scales minute. The spine on side of caudal peduncle short, about equal to one-half the width of orbit; it is less than one-half the depth of the caudal peduncle. Body compressed, elevated. The snout is straight; the mouth is small, with about 9-10 elobate teeth on each side of either jaw. Fins: The caudal is emarginate—the upper lobe the longer—the outer rays somewhat prolonged, 2.50 in length. The pectorals are equal to length of head. The ventrals are shorter, 1.33 into head. Posterior margins of anal and dorsal form acute angles. Color in spirits: Uniform dark brown; fins all black, except posterior two-thirds of pectoral which is yellowish white. Iris yellow with inner ring of black. In the young the pectorals are colorless. Five specimens, 2–7 inches in length, were taken inside the reef at Agaña, Guam, June 9, 1900. *Hab.* Western Pacific, Polynesia, Marianas.

197. **Teuthis triostegus** (Linn.).

Head 3.66; depth 2; eye 3.66; interorbital 3; D. IX 22; A. III 19; V. I 5; P. 15. Scales minute. Body ovate, compressed. Anterior profile curved, most convex over eye. Mouth small with about seven wide lobate incisors on each side. Fins: Dorsal with anterior spines more or less concealed in the skin. Caudal emarginate, the upper lobe slightly the longer. Color in spirits: Yellowish white with a wash of green, under surface white. Vertical fins dusky, pectorals white with yellow wash. Anal has a narrow margin of white. Body with five black vertical bands about as wide as pupil; first, from top of head through eye to branchiostegals; second, from base of first dorsal spine to base of pectorals where it branches, one branch going obliquely forward and down towards the isthmus, the other branch obliquely back and down to about ventrals; third, band from sixth dorsal spine to belly between anus and anal fin; fourth, from first dorsal ray to first anal ray; fifth, from seventh dorsal ray to fifth anal ray. A short black line over top of caudal peduncle, and a black dot on each side below. There is also a black line down the middle of snout. Eight specimens. Length 2–6 inches. Guam, May 26, 1900. *Hab.* Polynesia, Marianas.

198-204. **Teuthis lineatus** Bl. **Hijug.**

Head 4; depth 2; eye 3–3.50 into head; profile rounded, the snout, however, below the nostrils, is almost straight; D. IX 28; A. III 27; P. 17. Scales: About 8 rows between the lateral line and the base of the dorsal. Ground color of the sides and back canary yellow, with seven slightly oblique lines, blue in middle with dark on each side; these lines extend back to root of caudal fin. Lower part of body and belly grayish. A blue line passes down the middle of the forehead to the maxillary where it divides and forms a ring around the mouth; two other blue lines extend down on each side of this mid-line of the forehead; two or more blue lines begin on each side, just in front of the orbit, and curve down the sides of the snout to opercles. Other blue lines pass up and back from the hind edge of orbit to the lines of the body. Teeth flat, with dentate edges, 12 in each jaw. Fins: Ventrals with the longer outer ray blue, inner ones yellowish. Pectorals bluish.

Dorsal, anal and caudal dark, the dorsal with three or more blue lines running through it and terminating at the acute posterior angle of the fin. The anal has a narrow subterminal line of black, while tip of fin is bluish—the posterior part forms an acute angle. Caudal fin deeply lunate, the upper lobe the longer. There is a semi-lunar blue band about the middle of the caudal. Caudal peduncle strong, and armed with one white movable spine, considerably longer than the width of the eye. Variations: In spirits the bright canary yellow ground color fades into a dirty white. Guam specimens show a considerable variation in the arrangement of the blue lines about the base of caudal fin. They also fail to show the concentric arrangement of the blue lines in the dorsal fins as figured in "Fisches d. Sudsee," Vol. I., Haft IV. Seven specimens, length 4–11 inches, were taken inside the reef, Agaña, Guam, July 9, 1900. *Hab.* Polynesia, Marianas.

205. **Teuthis aliala** Linn.

Head 3.66; depth 1.50; eye 3.50; interorbital 3; D. IX 29; A. III 27; V. I 5; P. 16. Scales minute. Body elevated and compressed. Snout slightly concave; jaws with 5 elobate teeth on each side. Caudal peduncle about equal in height to length of its spine. Branchiostegals 5. Pseudobranchiæ developed. Fins: Caudal lunate, its longest ray 3.50 into length of fish. Pectorals equal to length of head; the ventrals are about one-third shorter. The posterior margins of the dorsal and anal are rounded. Color in spirits: Blue-black, a sub-crescentic area of Indian red just below the eye. A white ring around mouth. A line of yellowish white along the bases of anal and dorsal; posteriorly these lines broaden out and occupy about a third of the fins. Caudal is yellowish white with a white band and a black posterior margin. Spine on free portion of tail yellow. Pectorals and ventrals black. Dorsal and anal black, excepting the yellowish white marking mentioned above. Twelve specimens, one 7 inches in length, the others (very young) 1–2 inches in length. Agaña, Guam, July 14, 1900. *Hab.* Western Pacific, Polynesia, Marianas.

GENUS **CTENOCHÆTUS** SWAINSON.

206. **Ctenochætus strigosus** Bennett.

Head 4; depth 2; eye 3.50 into head; D. VIII 30; A. III 27; V. I 5. Scales small, about 19 between lateral line and the base of the last dorsal spine. Teeth setiform, movable with their outer end dilated and bent in and notched; 42 in upper row, 46 in lower. Color in spirits: Brown, faint traces of slight blue lines under the pectoral fins. Fins all black, except pectorals which are slightly yellowish blue. Caudal deeply lunate. The posterior parts of dorsal and anal not rounded, but forming very acute angles. Caudal peduncle stout and armed with movable black spine 1.30 times as long as width of eye. Probably *A. ctenodon*, Cuv. & Val., should stand for this fish, as such a marked increase in the number of teeth and scales, if fixed characters, would give it specific rank. Two specimens were taken. Length 1.50–6 inches. Guam, July, 1900. *Hab.* Polynesia, Marianas.

GENUS **ZABRASOMA** SWAINSON.

207-210. **Zabrasoma guttatus** Forst. **Hamoktan.**

Head 3.50; depth 1.50; eye 3.50, 3 into snout; interorbital 2 into snout; D. IX 28; A. III 23; V. I 5; P. 15. Scales very small, about 120 in lateral line. Body elevated and compressed. Snout slightly concave, each jaw with six deeply lobate incisors on each side. Branchiostegals 5. Pseudobranchiæ present. Fins: Caudal sub-truncate, the longest ray equal to length of pectorals, 3.33 into length of fish. Caudal peduncle high, about 2 into head, the spines about equal to one-half the height of the peduncle. Color in spirits: Brownish with two bluish white cross bands on the body and one on the shoulders extending down on opercles. These bands are slightly oblique, the first and second (measured on the median line) are about half as wide as eye; the third is narrow. The posterior two-thirds of the fish, including dorsal and anal fins are covered with numerous round whitish dots about the size of the pupil; these dots are blue in life. The thorax and ventrals are bluish white. The anterior half of caudal is yellowish white shading into dusky on posterior edge. Pectorals yellow. Four specimens, length 6–8 inches, were taken at Agaña, Guam, June 28, 1900. *Hab.* Western Pacific, Marianas.

211. **Zabrasoma agaña** sp. nov.

Head 3; depth 1.66; eye 3, 2 into snout; interorbital 3.33, equal to eye in specimens 4 inches long; D. V, 25; A. III 20; V. I 5. Scales minute, rough. Body very much compressed and elevated. Snout concave and somewhat produced. The caudal peduncle is equal in height to width of eye, and is one-third longer than the spine, which is white. The mouth is small; there are about 9 lobate teeth on each side of upper jaw. Branchiostegals 5. Pseudobranchiæ present. Fins: Caudal almost square, but the upper edge is a little the longer; the longest ray 4 into length of fish without caudal. The pectorals are equal in length to head, and about one-third longer than the ventrals. The posterior angles of dorsal and anal are rounded. Color in spirits: Yellowish; fins all similar in color; in some specimens the fins are a little brighter yellow. A white streak, one-half as wide as eye, extends back on the median line from near posterior edge of opercle to about on a line with base of tenth soft dorsal ray. Seven specimens, 2–4.50 inches in length, taken at Agaña, Guam, June 14, 1900. *Hab.* Marianas. Type is No. 211, B. P. B. M.

GENUS **SIGANAS** FORSKÅL.

212. **Siganas marmorata** (Quoy & Gaim.).

Head 4.33; depth 2.33; eye 3.33, equal to maxillary; interorbital 3.66; D. XIV 10; A. VII 9; V. I 3 I. Scales minute. Branchiostegals 5. Pseudobranchiæ well developed. Body oval, strongly compressed. Snout rather blunt and rounded; upper jaw somewhat overhanging. Teeth: A single row of cutting incisors in each jaw. Fins: Dorsal spines strong, the fourth the longest, its length equal to distance from the first vertical spine. Caudal only slightly forked, its longest ray equal to head; first ventral spine 1.33 into head, reaching more than half-way to anal. Color in spirits: Brown with wash of bluish; head and back covered all over with blue vermiculated lines which are wavy and longitudinal on the sides. Caudal, dorsal and anal with brownish lines. Pectorals yellow. Two specimens. Length 3–7 inches. Agaña, Guam, May, 1900. *Hab.* Western Pacific, Marianas.

213. **Siganas hexagonata** Günth.

Head 4; depth 2.20; eye 3.50; interorbital 3; D. XIV 10; A. VII 9; V. I 3 I. Scales distinct but small. Body oval and compressed; profile slightly convex. Maxillary equal to diameter of orbit, 3.50 into head, its distance from orbit equal to its length. Teeth: A single row of cutting incisors in each jaw. Branchiostegals 5. Pseudobranchiæ well developed. Caudal peduncle much compressed, its height 3 into head. Fins: Caudal deeply forked, its upper lobe slightly the longest, 3.20 into length of body; the depth of fork 1.50 into head. Soft dorsal and soft anal about equal in height and length; the longest ray of dorsal is 1.66 into head. Pectoral 1.25 into head, its base a little greater than diameter of orbit. Color in spirits: Blue with yellowish spots about one-half the diameter of pupil in size all over the body and head. These golden spots have narrow margins of black, outside of which the blue ground color shows in more or less hexagonal form. Dorsal, caudal, anal and ventral dusky bluish. Pectorals yellowish. Length of above specimen 13 inches. Four small *Teuthis* length 4–5 inches, which I take to be the young of this species, were captured at the same time. These show very indistinct hexagonal markings, and the general color is a much lighter blue with from 8–12 round black dots, one-half the size of pupil, scattered over the sides of the body. There is also a black opercular splotch on the upper posterior margin of opercle. The caudal is deeply forked. Head 4; depth 2.50; eye 3; interorbital 3. Agaña, Guam, July 12, 1900. *Hab.* Polynesia, Marianas.

214-215. **Siganas rostrata** Cuv. & Val.

Head 4.50; depth 3; eye 3.25; interorbital 3.20; D. XIV 10; A. VII 9; V. I 3 I. Body oval and compressed. The dorsal and abdominal profiles are equally convex. Mouth is rather small; the maxillary is contained about 4 into head, its distance from the anterior edge of orbit is one-half its length. Teeth: A single row of cutting incisors in each jaw, about 18 on each side of upper. Branchiostegals 5. Pseudobranchiæ well developed. Fins: The caudal is deeply forked, its upper lobe a little the longest, 3.66 into length; the depth of the fork is 1.20 into head. Caudal peduncle unarmed, its height is 4.50 into head. Soft dorsal and soft anal of about equal length, but the dorsal is a little the highest; its longest ray is contained 2 into length of pectorals. The base of pectorals equal the diameter of eye. Color in spirits: Bluish, the body covered with indistinct mottlings of yellowish spots and lines, wider than the interspaces of blue ground color; lighter blue on belly and thorax. The caudal in one specimen seems to be a uniform dusky bluish; in the other there are indistinct blotches of yellowish. Pectorals are yellowish, ventrals bluish; dorsal and anal dusky, the webs more or less yellowish white. Two specimens, length 10–11 inches. Guam, July 12, 1900. *Hab.* Western Pacific, Polynesia, Marianas.

GENUS **MONOCEROS** BLOCK.

216-221. Monoceros garretti[6] sp. nov.

Head 3.50; depth 2; eye 3.50, 2 into snout; D. VI 28; A. II 29; V. I 3; P. 16. Scales minute, rough. Body elevated and compressed. Two bony plates on the caudal peduncle with short, sharp keels. The yellow covering of the base sharply defined and separated by a black line. The snout is concave, but the profile is more rounded than in *M. lituratus*. The distance from base of first dorsal to the upper nostril is 1.33 into head. Mouth is perfectly horizontal on the median line. Teeth: A single series of sharp, compressed incisors, not serrated, about 10 on each side of upper jaw. Branchiostegals 4. Pseudobranchiæ developed. Fins: The height of the fourth dorsal spine equal to length from its base to anterior base of first dorsal spine. The first dorsal spine 2 into head. The caudal fin is emarginate, the upper lobe slightly the longest, its length 4.20 into height. Longest ray of pectoral 1.50 into head, its base 4.88. Longest ray of ventrals about equal to pectorals. The posterior margins of dorsal and anal forming acute angles. Color in spirits is a uniform lamp-black with a slight wash of neutral. There is a narrow yellowish green line extending down each side the snout from anterior of orbit to form a more or less complete circle on the lips. Two round yellow spots on caudal peduncle forming the bases of the keels. The caudal is black with a sub-terminal band of yellow, and a marginal band of white. The dorsal is black with a sub-marginal line of white which begins very narrow and gradually widens posteriorly to half the width of the fin; there is a narrow margin of black above this. There is no colored line at base of dorsal, as in *M. lituratus*. The anal fin is greenish, with a narrow black margin and the inner third with a wash of brown. Pectorals and ventrals brownish. This species is closely related to *M. lituratus* (Forst.), but differs in having a more rounded profile, a decreased number of dorsal and anal rays, a much darker general coloring, without a yellow line at base of dorsal, and with two distinct yellow spots on caudal peduncle separated by a sharply defined black area. These color markings are fixed and distinct in the entire series. This is undoubtedly the fish figured by Mr. Garrett in "Fisches d. Sudsee," Tafel 28, but it is not the fish described in the text, Vol. I., p. 124, which is a good description of *Monoceros lituratus* now before me. I have carefully compared a series of these two species of the same size and age, and as the differences stated above hold good, even in the details of the markings, I cannot put them under one species. Quoy & Gaimard, description and figure, will not fit either of these species, and I think their species should stand *M. carolinarum*, Quoy & Gaim., until the fishes of the Caroline Islands are better known. Their type specimen was eaten, and the figure may be approximately correct. Six specimens, length 3–6 inches. Agaña, Guam, July, 1900. *Hab.* Polynesia, Marianas. Type of species is No. 216, B. P. B. M.

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[6] Named after Andrew Garrett.

222-223. **Monoceros annulatus** (Quoy & Gaim.).

Head 4; depth 2.33; eye 2.66; interorbital 3; D. VI 27; A. II 28; V. I 3. Scales minute, rough. Body compressed and elevated. Forehead with a short projecting horn, situated below the level of the centre of orbits. In specimens 6.50 inches in length the tip end of this horn is equidistant from the orbit and teeth of upper jaw. Its length, measured from the orbit, 2.33 into head. Teeth small, finely serrate on inner side. The profile from first dorsal spine to tip of snout is slightly convex. Caudal plates absent in young; in specimens 6 inches in length are scarcely visible, and are entirely unkeeled. Color in spirits: Uniform light grayish brown, lighter on the caudal peduncle. Fins dusky, the caudal greenish yellow on the posterior half. Two specimens. Length 4–6.50 inches. Agaña, Guam, July, 1900. *Hab.* Western Pacific, Marianas.

224. **Monoceros lituratus** (Forst.).

Head 3.50; depth 2; eye 3.25, 2 into snout; D. VI 30; A. 30; V. I 3; P. 16. Scales minute, rough. Body elevated and compressed. Two bony plates on caudal peduncle with short, sharp keels—the yellow coloring of the bases intermingling. The distance from the base of first dorsal spine to upper nostril is 1.33 into head. The mouth is perfectly horizontal on the median line. Teeth: A single series of compressed incisors, 10 on each side of upper jaw. Branchiostegals 4. Pseudobranchiæ developed. Fins: The height of the fourth dorsal spine a little greater than the distance from its base to anterior base of first dorsal, the first dorsal spine about 2 into head. The caudal emarginate, the upper lobe slightly longer, its length 4.20 into length of fish. Longest ray of pectoral 1.33 into head, its base 4.25. Longest ray of ventrals 1.66 into head. Color in spirits: Light brown with a wash of grayish; a greenish streak, beginning at anterior edge of orbit, descends in a curve along sides of snout to angles of the mouth. Back with a blue line along base of dorsal fin. The interorbital space is crossed by a green band about half as wide as eye; this band crosses forehead and curves back over orbit to near top of opercles—in specimens long in spirits this green interorbital marking is apt to be faded out. The sides of caudal peduncle are yellow without a black area between the two spiny plates. Dorsal black with a white line beginning narrow in front, broadening posteriorly to half the height of the fin; above this is a narrow terminal line of black. Anal greenish white margined with a narrow line of black, the inner third without the conspicuous wash of brown seen in *M. garretti*. Pectorals and caudal brownish, the latter with a green and white margin posteriorly. Three specimens, length 5 inches. Agaña, Guam, July, 1900. *Hab.* Polynesia, Marianas.

225-227. Monoceros marginatus Cuv. & Val. Taloga.

Head 3.66; depth 2.33; interorbital 3.50; eye 4.50, 3 into snout. Forehead with a short horn-like prominence projecting forward directly in front of eye. In specimens 11 inches in length this horn is about three-quarters of an inch; measured from the orbit to tip it is 3 into head; in younger specimens it is shorter, and is entirely absent in specimens three inches in length. D. VI 29; A. II 28; V. I, 3. Scales minute, rough. Mouth perfectly horizontal; about 15 small sharp teeth on each side of upper jaw, about 12 on each side below; these teeth are minutely serrated on their inner side. Branchiostegals 4. Pseudobranchiæ well developed. Caudal peduncle with two sharply keeled bony plates with blue bases, absent in young. Fins: The caudal is broad and emarginate, the upper ray the longest, being equal to length of head. The dorsal has its origin directly above the posterior line of the head; its spines and rays are markedly triangular in transverse section, the first spine the longest, 1.66 into head. Ventrals are short, 2 into head. Pectorals 1.33 into head, their bases equal to eye. Color in spirits: A dirty bistre olive, slightly lighter below, dorsal and anal slightly darker with a narrow black margin. Anal with from 1-3 longitudinal lines. The caudal and pectorals with a more decided wash of yellowish, and with lighter margins. Five specimens, length 3-11 inches. Agaña, Guam, July 14, 1900. *Hab.* Western Pacific, Marianas.

FAMILY **BALISTIDÆ.**—TRIGGER-FISHES.

GENUS **BALISTES** (ARTEDI) LINNÆUS.

228-229. Balistes undulatus Mungo Park.

Head 3; depth 2.25; eye 5.50; interorbital 4.50; D. III, 28; A. 24. Scales 31, in series from base of spinous dorsal to vent, about 48 in lateral line. Caudal peduncle with 6 strong spines on each side, arranged in a double row—sometimes with an extra spine on one side. Color in spirits: A lamp-black; head and body with about 15 oblique or undulating lines of yellowish (reddish in life) about as wide as pupil; a broad line comes from each lip and, uniting about on a line with the eye, extends back to a little past and below the pectorals; another very distinct red line, just above this, extends from the upper lip to anus; a yellow line around lower lip; thorax black, without markings; spinous dorsal black; pectorals, anal and soft dorsal yellowish, the rays dusky at base; rays of caudal dusky, the membrane yellow, the fin white at tip. Two specimens. Length 7 inches. Guam, July 13, 1900. The markings of this species are very well shown in Quoy & Gaimard's figure (Voy. Uran. Zool., p. 208, pl. 47, fig. 1), but the caudal peduncle is drawn much too thin. In the specimens examined the caudal peduncle is very short and high, its height 2.50 into head. *Hab.* Western Pacific, Polynesia, Marianas.

GENUS **BALISTAPUS** TILES.

230-233. Balistapus aculeatus (Linn.).

Head 2.75; depth 2.50; eye 5.50; D. III, 25; A. 22. Scales 23, in a series from dorsal fin to vent. The caudal peduncle is armed with two and a half rows of sharp, curved spines with black bases. Fins: Caudal fin contained 6.5 times into length of the fish. Ventrals almost obsolete, represented by a single movable spine. Second dorsal and anal of moderate height. Pectorals short, about as broad as long, their bases black, the rays white. Scales rather large, some osseous scutes behind gill openings. Cheeks entirely scaled. Colors: Sides blackish, with two pairs of oblique whitish or yellowish bands descending from middle of sides to the anal fin. A broad black cross band between the eyes. Three blue vertical lines from the eye to the base of the pectorals. A yellowish band runs from the bases of the pectorals along the sides of the head to the snout; a brighter yellow line on premaxillary. Variations: One adult specimen has two extra spines on one side of caudal peduncle; these are just above the normal rows. The young are shorter and deeper, the head being 2.50 into total length, and the depth 2. A good series of specimens were secured, taken for the most part inside the reef, near Agaña, Guam, June, 1900. *Hab.* Western Pacific, Marianas.

234-237. **Balistapus rectangulus** Bl.

Head 2.66; depth 2.33; eye 6; interorbital 4; D. III 23; A. 21. Scales of medium size, entirely covering the cheeks; 4–5 osseous plates behind gill openings, three and one-half rows of recurved black spines on sides of the caudal peduncle; no groove in front of eye. Teeth notched and compressed, about 4 on each side of upper jaw. Fins: First dorsal spine very strong, 2.25 into head; caudal square; ventral spine movable. Color in spirits: Olive; belly, thorax and chin yellowish; a broad black band with lighter (bluish) edges over top of head through eyes, and widening as it extends obliquely back on sides of body to anas and anterior two-thirds of anal fin. Caudal peduncle encircled with black, which extends horizontally forward on the sides in the shape of an acute angle; this black is edged with lighter colored lines (yellow in life); a light yellow line passes from posterior base of soft dorsal horizontally forward to the big black line mentioned first; a narrow line extending down from anterior of orbit to a little in front of pectorals; the interorbital space is crossed by three narrow deeper black lines on the black field; webs of spinous dorsal and base of pectorals black; fins yellowish white. Four specimens, 4–6 inches in length. Agaña, Guam, June 28, 1900. *Hab.* Polynesia, Western Pacific, Marianas.

FAMILY **MONACANTHIDÆ**.—FILE-FISHES.

GENUS **AMANSES** GRAY.

238-241. **Amanses sandwichensis** Gray. **Paloman.**

Head 3.25; depth 2; eye 5; interorbital 3.50; D. I 36; A. 31. Scales minute, the skin velvety to the touch. Two pair of strong curved spines on each side the tail. Body elevated and compressed. Profile of snout slightly concave. Dorsal spine without barbs. Caudal fin rounded. Ventral spine not movable. Dorsal spine situated above anterior half of orbit. Color in spirits: A dirty light brown; the soft fins yellowish white; the dorsal spine brown; the caudal dusky with yellowish white on posterior part. Four specimens, length 4–12 inches. Guam, July, 1900. The young specimens do not have spines on the sides of the tail, and have the dorsal spine much rougher, with indication of two or three rows of barbules. *Hab.* Western Pacific, Marianas.

GENUS **OXYMONACANTHUS** BLEEKER.

242. **Oxymonacanthus longirostris** Bleek.

Head 2.66; depth 2.66; eye 5; interorbital 4; D. 1 35; A. 29. The sides of the caudal peduncle with brush-like setiform spines. Body oblong, compressed. The upper and lower profile about equally oblique; the snout much prolonged, upper profile concave, turned up at tip. Skin velvety. Mouth tubular, lips very thin. Gill openings small, situated on a vertical line a little posterior of orbit. Fins: The dorsal spine is of moderate strength, more or less rounded—not 4-edged; the middle of its base is directly (in line) above the pupil of the eye; its length is 1.50 into head, and it is equal to the distance from anterior margin of eye to posterior margin of lips. The barbs are small and more or less irregularly arranged, the most prominent being a row deflected downward on the back of the spine. The ventral spine is rather prominent, rough, fixed, with a thin abdominal membrane between it and belly. Caudal rounded, short, 2.25 into head. Ventrals 3.50 into head. Color in life: Blue, with yellow dots. In spirits: Light gray, with a slight wash of bistre-brownish. Seven longitudinal rows of round white spots about the size of the pupil extending from the head to tail; tip of snout white, followed by a narrow black ring; a line of white extends from near gape to a little below the orbit; another white line extends from the middle of sides of the snout to orbit. more or less white dots below the eye and on sides of the thorax; just above the ventral spines is a black splotch with numerous very fine white dots. Caudal fin brownish, white at tip, with an incomplete intermarginal black line half the width of eye. Dorsal, anal and pectorals white. Two specimens, length 4 inches. Agaña, Guam, June 14, 1900. *Hab.* Marianas.

FAMILY **OSTRACIIDÆ.**—TRUNK-FISHES.

GENUS **LACTOPHRYS** SWAINSON.

243. **Lactophrys nasus** (Bloch.).

Carapace, 5-ridged and spineless; P. 10; A. 9; C. 10. Color in spirits: Greenish yellow, with numerous black spots along sides. One specimen of a very young, length three-quarters of an inch, was secured. Guam, July 14, 1900. *Hab.* Seas of India to Malay Archipelago and western Pacific, Marianas.

GENUS **OSTRACION** ARTEDI.

244. Ostracion cubicus Artedi.

Carapace, 4-ridged, without spines; D. 10; A. 9. The back slightly convex, no raised ridge on median line. Color in spirits: White with scattered round black dots all over the body. One specimen, length three-quarters of an inch. Guam, July 14, 1900. *Hab.* Red Sea, western Pacific, Australia, Marianas.

358-361. Ostracion cornutus (Linn.).

Head 3.50; depth (at hump) 2.50; eye about 2; interorbital very concave, 4 into length; frontal spines 5.50 into length; posterior spines about the same; D. 9; A. 9; P. 11. Scales: About 10 plates in a line between caudal and eye. Body shortened and angular, the carapace 4-ridged, with a small ridge in the middle of back. The hind portion of tail covered by soft skin. Mouth small, maxillaries and premaxillaries coalescent. Teeth rather slender and in one row, about 10 in each jaw. Color in spirits: Carpace bistre-brown, with numerous irregular and indistinct darker blotches; below yellowish. Four specimens, length 1.50–5.50 inches. Agaña, Guam, July 12, 1900. *Hab.* Western Pacific, Malay Archipelago, Marianas.

246-248. Ostracion punctatus Bl. **Danglum.**

Head 3.50; depth 3; eye 3, about 2 into snout; interorbital 1.12; D. 9; A. 9; C. 8; P. 10. Carapace 4-ridged without spines. Back somewhat rounded without any ridge in median line. Interorbital space almost flat. Teeth: About 10 conical brown teeth in each jaw. Fins: Caudal 4.50 into length. Pectorals 1.50 into head. Dorsal and anal slightly shorter. Color in spirits: Brown, with small blue dots all over the body; older specimens have few or no spots on snout, and the spots are larger on sides and belly. Fins are dusky, with black bases. Young specimens have bluish spots on caudal fin, while old specimens have the posterior third of fin white. Three specimens, length 3–6 inches. Guam, June 14, 1900. *Hab.* Polynesia, western Pacific, Marianas.

FAMILY **TETRAODONTIDÆ.**—PUFFERS.

GENUS **TETRODON** LINNÆUS.

249. Tetrodon papua Bl.

Head 2.66; depth 2.1; eye 5, 3 into snout; interorbital concave, 3 into head; D. 9; A. 10; P. 16; C. 10. Spines minute, covering the entire body, except caudal peduncle. Nasal organs quite inconspicuous. Back compressed into a ridge. Bones of the upper and lower jaw in the form of a beak, with cutting edge. A median suture present. Fins: Longest dorsal ray equal to longest anal ray, 2 into head; longest ray of caudal 3 into length of fish; the space between the hind margin of dorsal and the base of caudal 4 into length. Color in spirits: Above, a sepia brown covered with blue spots with black edges; these spots thicker and smaller than pupil, on the posterior half; on the sides of head the spots are as large or larger than the pupil; several short radiating blue lines about eye; three or four across interorbital space. Older specimens have blue lines over the snout and on sides of the mouth. Under parts yellowish white with a median blue line on belly to anal in larger specimens. A black spot, a little larger than eye, covering the base of dorsal. Pectorals, anal and dorsal fins yellowish white. Caudal dusky yellow with numerous blue lines and dots. Six specimens, 1.25-3 inches in length, were taken at Agaña, Guam, inside the coral reef, July 12, 1900. These fish are usually found in pairs swimming about the coral reef; it is even difficult to frighten them so the two will separate, and when this is accomplished they seem to invariably join the same partner again. *Hab.* Polynesia, Marianas.

250. **Tetrodon reticularis** Bl.

Young: Head 2.50; eye 3.50; caudal rays 4 into length of fish and equal to distance from caudal to anterior base of dorsal; pectorals 2 into head; small spicules all over except at base of caudal; interorbital 3.50 into head. Color: Back, head and cheeks brown, with scattered blue spots. Two blue concentric lines below eye. Base of pectorals black with one or two concentric bluish rings. Belly yellowish white with about 18 longitudinal brown lines about three times as wide as the interspaces. Caudal dusky. Pectorals, dorsal and anal yellowish. One specimen, a young, 1.50 inches in length, was the only representative of this species secured. Agaña, Guam, July 12, 1900. *Hab.* Western Pacific, Marianas.

251. **Tetrodon immaculatus** Bl.

Young: Head 2.33; eye 3.50 into head; length of caudal ray 3 into head; pectorals 3; interorbital 3 into head. Color in spirits: Brownish above with about 8 oblique narrow black lines extending up and back from vicinity of pectorals to caudal and dorsal; below yellowish white, unstreaked. Caudal dusky, with black upper and lower margins. Pectorals, anal and dorsal white. One specimen, length 1.50 inches, taken at Agaña, Guam, July 12, 1900. *Hab.* Polynesia, Marianas.

252. **Tetrodon stellatus** Bl.

Young: Head 2.50; eye 3; interorbital 4; caudal rays 3.50 into length; pectorals 3. Color: Almost a lamp-black above, unspotted; white below, with 16 very black longitudinal lines of about the same width as the interspaces. A brown ring around snout. A few small blue spots on caudal peduncle. A black splotch larger than eye at base of pectorals. One specimen, length 2.25 inches, from coral reef at Agaña, Guam, June 12, 1900. *Hab.* Western Pacific, Polynesia, Marianas.

FAMILY **DIODONTIDÆ.**—PORCUPINE-FISHES.

GENUS **DIODON** LINNÆUS.

253. **Diodon hystrix** Linn. **Porcupine-fish.**

Head 3; depth 3.33; D. 15; A. 14. Spines strong; the spines behind the pectorals longest and strongest; frontal spines shorter, about as long as eye; spines about the dorsal and anal fins short, their bases free from spines. Caudal peduncle with two or three half rows of short spines above and below. Anal, dorsal and caudal of about equal length, 2 into head. Pectorals a little shorter, the upper lobe slightly longer. Color in spirits: Back and sides dusky, with numerous black spots. Belly white. All the fins greenish, with numerous round black dots. One specimen, length 15 inches. Agaña, Guam, July 12, 1900. *Hab.* Seas of India, western Pacific, Marianas.

FAMILY **SCORPÆNIDÆ.**—ROCK-FISHES.

GENUS **SCORPÆNA** ARTEDI.

254. **Scorpæna bakeri** sp. nov. **Baker's Rock-fish.**

Head 2.50; depth equal to head; eye 4; interorbital 5.50 into head; snout 3 into head; D. XII 10; A. III 5; V. I 5. Maxillary 1.80 into head. Scales about 34, breast scaly, head naked. Body oblong, somewhat compressed. Head large, naked above, with horny spines and dermal filaments. Teeth villiform on jaws, vomer and palatines. Supraocular tentacle more than twice diameter of eye. The dermal flaps along sides of body less than diameter of eye. Occiput with a very shallow depression. Interorbital groove deep and narrow; suborbital stay weak, a small spine in its middle and at its posterior end. Posterior edge of preopercle with four strong spines, the upper one the longest, equal to diameter of pupil and with a minute superimposed spine on its base. Preorbital with a strong spine directed forward and a strong one directed back and down. Nostrils with a distinct spine and dermal filament. Supraorbital bones each with four spines. Opercle with three or four spines; seven spines on each side of nape above opercles. Fins: The second anal spine longest and strongest, its length 2 into head; fourth, fifth and sixth dorsal spines the longest, 2.50 into head. Pectorals equal to distance from posterior margin of opercle to nostril. Base of anal 3.20 into base of dorsal. Caudal rounded, about equal in length to pectorals. None of pectoral rays branched. Color in spirits: Body mottled with dusky and grayish, with slight trace of Indian red; the under side of head is white with about 6 distinct brownish cross bands half as wide as interspaces. Fins grayish, mottled with black and white. Four specimens, length 1.50–2.50 inches. Guam, July 14, 1900. *Hab.* Marianas. Named in honor of Capt. Jesse E. Baker, U. S. A., whose assistance in the author's field work has been greatly appreciated.

GENUS **SCORPÆNOPSIS** HECKEL.

255. Scorpænopsis guamensis Quoy & Gaim.

Head 2.35; depth 3; eye 3; interorbital 2 into eye; length of snout slightly less than eye; maxillary 2.50; D. XII 9; A. III 5; V. I 5; P. 19. Scales 44; cheeks and opercles scaled. Teeth villiform in jaws and vomer. Interorbital space concave. No orbital tentacles, no groove beneath the eye. Maxillary reaches to below middle of orbit. Supraorbitals, occipitals, opercles and orbitals with acute spines. Color in spirits: Brownish, with marblings of dark brown. One specimen, length about 3 inches. Guam, July 13, 1900. *Hab.* Malay Archipelago, Marianas.

GENUS **SYNANCEIA** BLOCK.

256-257. Synanceia thersites sp. nov.

Head, exclusive of skinny flap, 2.50; depth 2.66; eye 8; premaxillary 3, very narrow and bearing the villiform teeth of upper jaw; the maxillary flat and wide, its width slightly greater than orbit; interorbital space fossa-like, 3.50 into head; D. XIII 7; A. III 6; P. 19; V. I 5. Numerous dermal flaps on head and body. Head monstrous and irregularly shaped; lower jaw almost vertical; the upper margin is on the dorsal surface, its length 1.50 into head. Villiform teeth in both jaws, but none on vomer or palatines. Gill-rakers consisting of villiform teeth slightly longer at angle, and longer curved teeth on head of pharyngeals. Branchiostegals 7. Pseudobranchiæ present. Fins: The dorsal is continuous, the soft part highest. Caudal more or less rounded, 2 into head. Ventrals 1.20. Pectoral very wide, its base about equal to its longest ray. Color in spirits: The general ground color is almost a sepia brown, darker with a wash of greenish on posterior part. There is a more or less greenish white area near the middle of the body, under 6–8 dorsal spines. There is a greenish white band about as wide as eye which forms a band about the middle of the soft dorsal, anal and the posterior part of body. The caudal fin is narrowly tipped with yellowish white with a black subterminal band as wide as eye; anterior of this is a white band of about equal width; the remainder of the fin is blackish. The pectorals are margined with white, their ground color is dusky with more or less mottling of greenish white. Ventrals are similarly colored, except that the mottlings take more of the form of four or five incomplete cross lines. Pectorals and anal dusky, with mottlings of greenish white. Two specimens, length about 9 inches. Guam, July 12, 1900. The dorsal spines of this fish are very poisonous, and the natives fear them more than scorpions. One of the above specimens was damaged by having its head crushed by a native who was intent on killing the fish. Type No. 256, B. P. B. M. *Hab.* Marianas. Named for Thersites, "The ugliest of the Greeks."

GENUS **PTEROIS** CUVIER.

258. **Pterois zebra** Cuv. & Val.

Head 2.66; depth 2.66; eye 2.66 into head; interorbitals 4.50 into head; D. XI I 13; A. III 6; P. 17; V. I 5; C. II 14 II. Scales 10-59-13. Mandibles 1.16 into head. Maxillary 1.50 into head, reaching to a line with anterior margin of pupil. Gill-rakers short and blunt, about 9 on lower arm—armed with minute teeth. Body oblong, compressed. Teeth villiform in jaws and vomer. Interorbital space deeply concave, the upper margins each with a fleshy tentacle one-third as long as head, and alternating white and brown in color. There are four fleshy tentacles on the snout, one just posterior of each anterior nostril, and two in the middle near tip of snout. There is also a short fleshy tentacle on lower anterior corner of preorbitals, and two on each lower posterior margin of each preopercle. The upper margin of orbit is armed with one large and three small spines. Preorbital is armed with several spines and ridges, one ridge extending back near the lower margin of inferior orbital to the preopercle. Immediately beneath this ridge are several small spines. Posterior margin of preopercle armed with three spines. About eight spines on top of head just back of interorbital region. Continuing from the anterior end of lateral line is a row of five small spines extending to orbitals. Scales: Lateral line well developed; scales on nape, body and head, except on snout and interorbitals. Branchiostegals 7. Pseudobranchiæ well developed. Fins: Caudal is rounded, 1.15 into head. Pectorals very elongate, reaching tip of caudal. Spinous dorsal long, the longest spine 2 into length. Ventrals slightly longer than head. Soft dorsal and anal reaching beyond the base of caudal, their longest rays about equal, 1.50 into head. Base of anal 3.08 into base of dorsal. Color in spirits: Ground color sepia brown; three single yellowish white lines over back of neck between the orbitals and first dorsal spine. Beginning with the third dorsal spine the body is banded with twelve narrow, double, white lines with a narrow interspace of brown between each line; these lines seem to be in pairs, four of the narrow white lines with their interspaces making up a band, ot which there are seven on the body with interspaces about equal to diameter of eye. The last three pairs of bands extend obliquely forward and down, on the caudal peduncle. Thorax is yellowish white with one broad band of brown extending from the base of one dorsal fin to the other. Snout and under part of head yellow, the snout having two brown spots on each side; a broad brown band from lower anterior margin of eye to posterior end of maxillaries; another, edged with white extends from top of orbitals through eye to lower anterior margin of opercles. Axis of pectorals black, with a wide white line; a curved white line on the fin just posterior of axis. The base of pectoral is brown; a white area on base of rays surrounded by a clouded black area, the black extending half the distance of the rays. Ventrals have yellow rays and black membranes. All the remaining fins are marked with alternating irregular lines of brown and white. The above description is of a male, length 4 inches. Guam, July 13, 1900. A young female, length about 3 inches, taken at the same time, while structurally similar is quite differently marked, and much more nearly resembles Quoy & Gaimard's figure (Voy. Astrol. Poiss, Pl. XI., p. 6), except the upper portion of the white lines are not distinctly divided. *Hab.* Polynesia, Marianas, seas of India.

FAMILY **PLATYCEPHALIDÆ.**

GENUS **PLATYCEPHALUS** BLOCH & SCHNEIDER.

259-60. Platycephalus punctatus Cuv. & Val.

Head 2.66; depth 3.50 into head; eye 4.20 into head; snout 3; interorbital 4 into eye; D. VIII, 11; A. 12. Head flat, spinate; lower jaw the longer. Body sub-cylindrical. The lateral line smooth. Teeth villiform; the maxilla reaches to anterior margin of eye. Supraorbital margin toothed posteriorly, and with a distinct spine anteriorly. Lower margin of inferior orbital with a row of spines which end in the strong spine of preopercle; two small spines just below the preopercular spine. Two spines on snout. Occipital region with several spines. Opercle with two spines on upper posterior part; just above opercle is an irregular row of about six spines reaching to orbit. Fins: Caudal square. Ventrals 1.20. The first dorsal and anal fins of about equal length, 2 into head. Base of soft dorsal slightly less than base of anal. Color in spirits: Grayish, with four or five wide brownish cross bands from the back to middle of sides. Under surface white. Pectorals yellowish, with brown dots and lines. First dorsal yellow, with a broad black mark on posterior third. Ventrals dark above and on posterior third. Soft dorsal and caudal yellowish, with brownish lines or dots. Anal yellow. Two specimens, length 4–6 inches. Guam, July 13, 1900. *Hab.* Seas of India to Malay Archipelago, Marianas.

FAMILY **AGONIDÆ.**—SEA-POACHERS.

GENUS **PERCIS** SCOPOLI.

261-62. **Percis cephalopunctatus** sp. nov. **Pipupu.**

Head 3.66; depth 6.30; eye 4.66; snout 2.66; interorbital 3 into eye; D. IV 21; A. 17; V. I 5. Scales 71. Mandible 2.15. The lower jaw the longer. Two opercular spines. Body somewhat elongate and sub-cylindrical. Head somewhat depressed. Villiform teeth in jaws and vomer, none on palatines; outer row in jaws somewhat enlarged with three canines on each side in anterior part of lower jaw. Branchiostegals 6. Pseudobranchiæ present. Scales ctenoid. The spineus dorsal is scarcely connected with soft dorsal. Gill membranes connected at isthmus. The second dorsal spine the longest, equal to orbit. Fins: Caudal slightly rounded. Pectorals 1.50 into head. Base of anal 1.50 into base of dorsal. Ventrals 1.15 into head. Color in spirits: Upper surface greenish, with 9 indistinct darker lines over the back. Below axis the color is yellowish white with 9 greenish bands; the upper parts of these bands are all united by a narrow greenish line on the axis extending from axis of pectorals to lower part of caudal fin; just above this line and alternating with the green bands of the lower half are 9 greenish spots almost as large as eye, which have wide yellowish white margins; these extend from pectoral fin to caudal. A large brown spot at base of pectoral fins. Two brown spots on lower part of opercle. Four large brown spots on cheeks, and two or more on jaws. About fourteen small brown dots, smaller than pupil, scattered over snout and top of head. Spinous dorsal white. Soft dorsal with three rows of brown spots. Caudal with a big dark brown blotch on its basal half, with scattered brown dots around it. Pectorals, ventrals and anal white. Three specimens, length 4–5.50 inches. Guam, June 14, 1900. *Hab.* Marianas.

FAMILY **GOBIIDÆ.**—GOBIES.

GENUS **ELEOTRIS** (GRONOW) BLOCH & SCHNEIDER.

263-66. **Eleotris fusca** (Bl.).

Head 3; depth 4; eye 6.30; snout 3.66; D. VI 9; A. 9. Scales rather small, about 62 series behind pectoral fin. Preopercle with blunt spine bent down and forward. Body subcylindrical, head oblong. Teeth in setiform bands, none on vomer or palatines.

Two dorsal fins. Anal papillæ distinct. The back, in front of first dorsal somewhat concave. Fins: Caudal rounded. First dorsal fin small, its height a little more than one-half depth of body. Pectorals equal to distance from hind margin of preopercle to anterior of orbit. Soft dorsal fin almost one-half higher than spinous dorsal, its base slightly greater than base of anal. Color in spirits: Leaden black, sometimes lighter below with slight wash of yellowish. Fins dusky with lighter fine yellowish lines or dots. Four specimens, length 5–6.50 inches. Guam, May 31, 1900. *Hab.* Polynesia, India, Malay Archipelago, Marianas.

GENUS **GOBIUS** (ARTEDI) LINNÆUS.

267. **Gobius deltoides** sp. nov.

Head 3.50; depth 5; eye 4; interorbital 2 into eye; snout 3 into head; D. VI, I 11; A. I 11. Scales 28 from upper posterior margin of opercle to caudal; no lateral line; head fully scaled. Body slightly elongate, compressed posteriorly. Branchiostegals 5. Pseudobranchiæ present. Teeth in two series in each jaw, the outer row with larger recurved canines. Ventral fins united, forming a disk which is attached only at its base. Caudal rounded. Base of anal about equal to base of soft dorsal. Color in spirits: Yellowish white with about seven reddish brown blotches along the sides above the axis, alternating with similar spots below the axis. A black line extends vertically down from the lower margin of orbit to a brown spot below the eye; here the line divides into two, which extends under the chin, one on a line with the eye, the other forming an angle directed forward, the two lines thus forming the Greek letter delta. These two lines are broken by the isthmus. Anal fins slaty blue. Ventrals with a wash of bluish. The remaining fins are grayish with numerous small brown spots and lines. Eighteen specimens, length 1–2 inches. Guam, June 2, 1900. *Hab.* Marianas.

GENUS **ELEOTRIS** (GRENOW) BLOCH & SCHNEIDER.

268. **Eleotris miniatus** sp. nov.

Head 3.50; depth 3.25; eye 3; snout equal to diameter of eye; the interorbital equal to pupil; D. VI 7; A. II 9. Scales 26. Body oblong, slightly elongated. Teeth in jaws villiform, with some outer enlarged canines; no teeth on vomer or palatines. Fins: The third dorsal spine terminates in an elongated filament reaching half of the distance to base of caudal. The longest soft rays of dorsal and anal are about equal in length, and equal to length of head. Caudal slightly rounded. Pectorals slightly longer than head. Color in spirits: Olive brown with darker markings above the axis which take on more or less the form of half bands from the back to the axis of the body. Most of the scales of the body have a small central dot of pearly white. There is a black band vertically down from the lower margin of the eye to the isthmus. Fins are all dusky. Three specimens, length 1.50 inches. Guam, July 1, 1900. *Hab.* Marianas.

GENUS **PERIOPHTHALMUS** BLOCH & SCHNEIDER.

269. **Periophthalmus kœlreuteri** (Pall.). **Maching.**

Head 3.50; depth 2 into head; eye 4.20 into head; D. XV, 12; A. 11. Scales 90. Eyes large and elevated. Anterior profile of head very abrupt. Body elongate, sub-cylindrical anteriorly, compressed behind. Teeth: About 23 conical pointed teeth in each jaw. Fins: Lower margin of caudal obliquely truncate. The spines of anterior dorsal fin very flexible. Pectoral with its basal portion muscular and free. Ventrals short, connected on their basal third. Color in spirits: Body olive brown; head may have numerous small dots of lighter color. Spinous dorsal dusky, tipped with white, and with a rather wide and distinct sub-terminal band of black. Soft dorsal broadly tipped with white, with a subterminal black band, below which is a narrow irregular line of white, the basal third of the fin being more or less white-dotted. Caudal and pectorals dusky. Ventrals white below, dusky above. Anal white. Four specimens, length 4–5 inches. Guam, June 14, 1900. *Hab.* Coasts of India, Andamans, Malay Archipelago, Marianas. These lung fishes are very abundant, and when frightened usually hop out of the water and take to land for safety.

FAMILY **BLENNIIDÆ.**—BLENNIES.

GENUS **SALARIAS** CUVIER.

270. **Salarias periophthalmus** Cuv. & Val.

Head 4.66; depth 5.33; eye 3.50; interorbital 2 into eye; D. XII, 20; A. 21; C. 15. No scales. Maxilla reaches to below hind margin of eye. Body elongate, cylindrical anteriorly. Snout blunt. Gill openings wide. A simple tentacle about half the length of eye above the orbit, and a fringed one at the nostrils. A row of small movable teeth in each jaw. Fins: Dorsal fin not continuous on to the caudal. Caudal is almost square; the lower rays, however, are a little the longest. Color in spirits: Yellowish white with about six pairs of slightly darker cross bands down the sides. A short oblique blue line just back of and below the eye. A few small dusky spots on side of head. Two rows of dark-margined ovate blue spots down the sides of body. Fins: Yellowish white, the anal with a dark margin. Three specimens, length 2–4.50 inches. Guam, June 2, 1900. *Hab.* Andamans to Malay Archipelago, Marianas.

271. **Salarias nigripes** sp. nov.

Head 3.66; depth 3.20; eye 3; interorbital 2 into eye; D. 25; A. 17; V. 3; P. 15. No scales, but an incomplete lateral line which seems to terminate on a line with the tip of the pectoral fins. Maxillæ reaching to below the posterior part of eye. Teeth small, movable; a single row in each jaw; no canines. A small tentacle over the eye, and another at nostril. A fringed row of these short fleshy tentacles over the posterior margin of the head, from the upper margin of one opercle to the other. Body slightly elongate, compressed posteriorly. Branchiostegals 6. Pseudobranchiæ present. Fins: The caudal is square, and equal in length to pectorals. The dorsal commences on a line with tip of opercle and extends to base of caudal fin. The base of anal is contained twice into base of dorsal. Length of pectorals about equal to depth of body, their base 2 into head. Ventrals small, 1.50 into head. Color in spirits: A uniform warm sepia brown, with a few small white dots on snout and below the eye. Anal fin a uniform black. The remaining fins uniform with coloring of the body, except the upper anterior part of dorsal, and the upper third of caudal, which are white; the white on caudal beginning on the base of the upper two or three rays and broadening posteriorly.[7] Thirty specimens, length 1–2.75 inches. Guam, July 12, 1900. *Hab.* Marianas.

272. **Salarias nitidus** Gunth.

Head 4.50; depth 5.66; eye 3 into head; interorbital 2 into eye; maxillæ reach to below posterior margin of eye; no scales; D. 32; A. 21. Branchiostegals 6. Gill openings wide. Teeth: A single row of small movable teeth in each jaw; posterior canines not always present. Body somewhat elongate and compressed posteriorly. Mouth transverse, a tentacle about as long as width of eye, on upper part of orbit; also a small one at nostril. Dorsal fin scarcely notched, beginning above the opercle and terminating just in front of caudal. Color in spirits: Yellowish white, with indistinct indications of seven or eight brownish cross bands. A round black dot, slightly smaller than eye, on each side of body, below the notch of the dorsal fin. Head and body with numerous lighter yellowish dots. Dorsal fin with a row of brown dots along middle. Anal and caudal with dark margins. Six specimens, length 1–3.50 inches. Guam, June 14, 1900. *Hab.* Samoan Islands, Marshall Islands, Marianas.

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[7] Regardless of any other differences this white pattern of the caudal fin would seem sufficient to warrant this form to stand as a distinct species, for in the thirty specimens before me there is no variation from this type of caudal marking.

FAMILY PLEURONECTIDÆ.—FLOUNDERS.

GENUS PLATOPHRYS SWAINSON.

273-74. Platophrys pavo Quoy & Gaim. Tampat.

Head 3.66; depth 2; eye 6.50; interorbital 3, concave; D. 95; A. 73. Scales 94, the lateral line curved. Maxillary 2.66, the posterior end being on a line with anterior margin of eye. Mandible 2 into head. The posterior two-thirds of the interorbital space is scaly. The cleft of the mouth is of moderate width. The teeth are small, in a single series in each jaw. The whole of the lower eye is anterior of the upper. Body elliptical, ovate, strongly compressed. Anterior profile slightly concave, the snout projecting (more noticeable in old than in young specimens). Lower jaw with a well developed knob at symphysis. Anterior end of maxillary with a small blunt spine. The elevated orbital rims are smooth. Gill-rakers moderate, their length equal to diameter of pupil—10 on lower limb, none on upper. Scales ctenoid. All the fins except pectorals more or less scaled. Fins: The caudal is rounded. The base of the ventral of the colored side is 3 into head, the base of the ventral on the white side being only one-half as long. The dorsal begins on the snout in front of the eye; the longest ray is 2 into head. The upper rays of the colored pectorals are elongated and filiform. The longest ray of anal is about 2 into head. Color in spirits: A mottled yellowish brown, covered everywhere with numerous ocelli of various sizes, those on middle of sides largest, being equal to longitudinal diameter of orbit; these ocelli usually have a minute brown dot in the middle on a small whitish zone, surrounding which is a blue ring with brown margins, the blue zone making up the largest part of the ocellus. There are three large dusky blotches on the lateral line. The dorsal and anal fins are slightly darker in color, the anal with six small dark blotches along its inner half; the dorsal with about eleven of these dusky splotches; otherwise these fins are mottled with bluish, brown, and whitish spots. Colored pectoral with a dusky blotch near its centre. Four specimens, length 1–9 inches. Guam, June 2, 1900. *Hab.* China, Kokas Islands, New Hebrides, Marianas.

Notes on the Birds of Kauai.

BY WM. A. BRYAN AND ALVIN SEALE.

THE following observations are based on a collection made jointly by the authors for the Bernice Pauahi Bishop Museum during a short sojourn on the island of Kauai, extending from April 12 to May 4, 1900. The two principal centres of field work were the Kaholuamano mountain house, and in the vicinity of Mr. August Knudsen's home near Waimea.

Kaholuamano, which is the place where Messrs. Wilson, Palmer and Perkins carried on much of their work, is the property of Mr. Francis Gay and is splendidly located in the midst of the forests on the western slopes of Mount Waialeale at an elevation of about 3800 feet above the sea. To the Messrs. Gay and Knudsen we are indebted for much of the success of the trip.

The collection numbers one hundred and forty skins and skeletons, besides some nests and eggs and much valuable alcoholic material. In most cases a very full series was secured of the seventeen species taken. The field jottings are for the most part taken from Mr. Seale's notes whose diary extended over the whole period.

Larus barrovianus Ridgw. **Point Barrow Gull.**

Attention has elsewhere (Memoirs B. P. B. Mus., Vol. I., pt. 3, p. 96) been called to the securing of two specimens of this gull on the island of Kauai by Mr. Francis Gay, whose hospitality we enjoyed, and who was so abundantly able to help us in our work. He kindly presented one of the specimens to the Museum. It was the opinion of that gentleman that they had wandered down to the island from the far north, having been lost at sea. Both specimens were in poor flesh when they were secured, one being unable to fly. One of the birds is still in Mr. Gay's private collection.

Diomedea nigripes Aud. **Black-footed Albatross.**

Our notes for the morning of April 12 take account of this species flying about the ship as we were crossing the channel between Oahu and Kauai.

Puffinus newelli Henshaw. **Ao.**

This species has long been known to the natives of Kauai, where it was called Ao. A single specimen in Mr. Gay's collection was presented to the Museum and was the only example of the bird secured. Mr. Gay states that it is fairly common in certain cliffs in the mountains. It has been his observation that they live at lower elevations and closer to the sea than does the Uau (*Æstrelata phæopygia*). Even when they are found in the same cliffs the Ao keep by themselves in the lower part, and the Uau to themselves higher up. The fact that the native name of this bird has come down to us through all these years, but that the species to which it had been applied by the kanaka naturalists should but so recently come to the light of science speaks much in the favor of those skilled old bird-catchers who had worked out the ornithology of their land with such exactness.

Oceanodroma castro (Harct.). **Hawaiian Storm Petrel. Oeoe.**

No examples of this bird were seen except in the private collection of Mr. Gay. He has found them many times in suitable cliffs on the higher mountains.

Phaëthon lepturus Lacep. & Daun. **White-tailed Tropic Bird. Koae.**

On April 14 our notes state that six tropic birds were seen at different times sailing about the cliffs above the Waimea river, along which stream the path leads for a considerable distance of the way to the mountain house. The splendid cliffs which are in many places hundreds of feet high seem to be ideal nesting sites for this species which, so far as it has been possible to learn, chooses high cliffs in preference to flat rocks, etc., as is the habit of the Red-tailed Tropic Bird on Laysan and Necker Islands. While no specimens were taken during our stay they were seen in various places at intervals during our visit. The specimens in Mr. Gay's collection taken on Kauai, all of which were undoubtably the same as species seen, were the white-tailed form, as are also the skins in the Museum series.

Anas wyvilliana Sclater. **Hawaiian Duck. Koloa maoli.**

On the morning of April 23, while riding along the turbulent mountain stream Wailie, Mr. Seale saw a flock of fourteen of these ducks swimming about in a quiet eddy. Three were taken—two males and a female. Later on three more ducks were seen, but none taken. On May 4, while collecting at Mr. Knudsen's place, several flocks were seen in the low swamps. The pair (Museum No. 9424 ♂, 9423 ♀) are in full plumage. The freshly killed specimens have dark hazel eyes; the bill dark sepia, darkest on the upper mandible, and with a greenish tinge on the sides of upper mandible in the male. The feet are white, with a yellowish cast in the female, and white with an orange yellow tint in the male.

Nycticorax nycticorax nævius (Bodd.). **Black-crowned Night Heron. Auku kohili.**

One immature female (Mus. No. 9433) was taken from flocks near Waimea, where it was abundant in the low lands.

Gallinula sandvicensis Streets. **Hawaiian Gallinule. Alae.**

While collecting in the swamps about Waimea on May 4 this species was noted as especially abundant.

Fulica alai Peale. **Hawaiian Coot. Alae keokeo.**

A female (Mus. No. 9432) was taken in the ponds near Mr. Knudsen's home. The freshly killed bird has a cherry-red eye; the frontal shield is white with a light bluish tip to the upper mandible; the feet are a bluish green. A number of nests of the white-shielded coot were seen among the rushes looking very much like a small platform of grasses with a slight hollow in the centre for the eggs. Usually, though not always, the grass was bent down over the nest so that it was partly concealed. The nests were in colonies of six or eight. One set of six eggs was taken. The nest was among the rushes about twenty feet back from the open water; the rushes were in water fourteen to eighteen inches deep.

Himantopus knudseni Stejn. **Hawaiian Stilt. Kukuluaeo.**

The eggs, nestlings, a half-grown bird and four adults were taken on May 4. The ponds near Mr. Knudsen's house cover an area of several acres, and at this time of year are so shallow that one can wade anywhere in them. Indeed rushes occupy a large part of them. From the great excitement our approach caused it was plain that the birds were nesting. The stilts were wading about in the water or running about on the land. There were hundreds of these birds in sight. They uttered a sharp, rather harsh cry almost incessantly when on the wing. A nest was soon found which proved to be an old one with one bad egg in it. Shortly after Mr. Knudsen found a nest containing two eggs and two recently hatched young. The nest is usually little more than a slight depression in the ground—often an old cow track—with a few broken bits of coarse weeds scratched into it. The nest taken was among some weeds about fifty yards from the water. The old birds were quite fearless. Approaching to within a few feet of us, they would affect all sorts of ailments to decoy us from the nest. A favorite method of decoying was to lay flat on the ground with their wings spread out. They would often affect the broken wing trick which is so frequently adopted by waders. They have a curious sort of dance, in which they bend their long legs at the tibio-tarsal joint and bob up and down in a most ridiculous fashion. Mr. Knudsen said that he had only noticed them performing in this manner during the nesting season. One specimen taken (Mus. No. 9427) was almost half-grown, but as a rule nesting was not so far advanced. A set of four eggs were taken which were too badly incubated to save.

Heteractitis incanus (Gmel.). **Wandering Tattler. Ulili.**

Occasional specimens were seen. On April 23 two birds were noted at an elevation of 3500 feet, while on May 4 in the marshes and ponds they were fairly common.

Limosa lapponica baueri (Naum.). **Pacific Godwit.**

Notice has been taken (Memoirs B. P. B. Mus., Vol. I., pt. 3, p. 27) of the specimen in Mr. Gay's collection which was secured by him. The specimen is in winter plumage and was secured in the late autumn.

Charadrius dominicus fulvus (Gmel.). **Pacific Golden Plover. Kolea.**

On April 14 a flock of five were seen feeding at an elevation of 1200 feet, and at 2000 feet another flock was sighted. They were noted again on May 4 as being quite plentiful at the Waimea ponds. On April 23 a male was taken (Mus. No. 9397) with the testes very much enlarged (.19×.60), going to show that the mating season was well advanced.

Phasianus torquatus Gmel. **Ring-necked Pheasant.**

Pheasants were seen on a number of occasions, but no place were they as common as in the Waianae mountains on Oahu.

Turtur chinensis (Scop.).

Chinese Turtle Doves are quite common on Kauai.

Asio accipitrinus sandvicensis (Blox.). **Hawaiian Owl. Pueo.**

This bird was seen, toward nightfall especially, sailing about the cliffs and over the valleys. On one occasion one was seen to drop almost straight down for perhaps three hundred feet, and after a short time to rise from the bushes and wing off to a tree with what looked like a wild chicken a fourth grown.

Chasiempis sclateri Ridgw. **Apekepeke.**

Of this interesting little fly-catcher a very complete series was secured. They are, like their cousins on Oahu and Hawaii, the most abundant and most easily obtained of any of the native birds.

It is not uncommon to have them approach to within a few feet of one, and after satisfying their curiosity to resume their feeding and calling, so that they are easily studied while alive. They are met with almost invariably in pairs. The ochreous-colored immature birds keeping together and the adult white-rumped ones keeping together, so that we have not yet seen an adult and an immature bird mated. No nests were taken. Everything indicated that it was past the nesting time. An adult was seen feeding a young which was just able to fly. At another time, April 18, a pair of adults were seen feeding four young which were quite able to fly; however, they were being cared for with as much solicitude as they would have been if they were perfectly helpless. One of the four, a juvenile female (Mus. No. 9408), was taken, and since there is no description of this interesting plumage it might be well to note that it more nearly resembles the mature bird than it does the immature plumage which intervenes. The plumage all over has a cottony appearance. The sides, top and back of the head are pale ochraceous mixed with brown, and with bluish gray bases to the feathers. The throat is white with some buffy markings. The breast whitish with faint smoky and ochraceous markings to most of the feathers. The abdomen is whitish. The back and rump mottled with sepia, pale ochraceous and whitish. The wing feathers and coverts are sepia-tipped and narrowly edged with pale ochraceous. The tail is dark sepia with whitish tips on the inner web of all but the centre pair of feathers, and with a faint indication of whitish on the outer edge of the outer pair. The bases of the feathers of the body all over are mouse-gray which in life adds much to the adult appearance of the fledgling stage. The feet are bluish; the eye dark hazel, and the upper mandible dark while the lower is quite yellowish. Length 4.75, wing 2.50, tarsus 1.00, culmen .44. Aside from the fledgling just described the series taken is divided into ochraceous immature, and adults, indicating that it requires at least two years to reach the adult plumage.

Acridotheres tristis (Linn.). **False Mina.**

Common everywhere, ranging to the summit of Waialeale.

Carpodacus mexicanus obscurus McCall. **House Finch. "Rice Bird."**

Common on lowlands; one specimen taken at Kaholuamano.

Munia nisoria (Temm.). **Chinese Sparrow.**

Common in flocks in the valleys.

Vestiaria coccinea Forster. **Iiwi.**

A fine series was taken in both immature and adult plumage. It seems to require at least two years for the Iiwi to assume the plumage of the adult.

Himatione sanguinea (Gmel.). **Apapane.**

The Apapane is fairly common on Kauai. Several flocks of from five to fifteen individuals were seen feeding on a single koa or ohia tree. The bird is far more abundant on Kauai than on Oahu.

Chlorodrepanis stejnegeri (Wilson). **Kauai Amakihi.**

Of this sturdy species only four examples were taken. All the specimens seen were feeding among the flowers of the ohia growing at an elevation of not less than 4000 feet. None were noted about Kaholuamano. Doubtless they were more plentiful towards the summit of Waialeale, but the rainy season was on and as a result the whole forest was one all but impassable quagmire, in which it is perilous to even follow the rude trail, to say nothing of taking the chances ot losing it in the dense fogs and rains which envelope the summit almost continuously.

Chlorodrepanis parva (Stejn.).

Perhaps the most interesting series of skins secured during the trip was of this species. About Kaholuamano they were seen but rarely, but along the ridges towards the summit of Waialeale they were more and more abundant so far as our explorations extended. At this season they are met with, feeding about in loose flocks of a dozen or more, picking at the flowering ohia. Many times they were secured from trees in which *L. cæruleirostris* (Wils.) and *H. sanguinea* (Gmel.) were feeding. Often they would alight on the low branches to sing or to preen, but they seemed to confine their feeding grounds to the flowers of the ohia which at this season were blooming profusely. On the morning of April 18, while collecting in a little valley which sloped off from the main ridge two miles northeast of the mountain house, at an elevation of about 4000 feet, we noted a tall slender ohia that was growing down close beside the little mountain stream, in rather open ground, though well protected from the wind. Attention was attracted to it by the rather unusual flight of what proved to be a fine adult male (Mus. No. 9365) of *C. parva*. By a careful search it was possible to locate the nest of the bird in the topmost branch of the tree some forty feet from the ground. Shortly after the male was secured the female (Mus. No. 9366) flew straight to the nest and proceeded to feed the young. Climbing the slender swaying tree was a difficult and somewhat dangerous task, but it was rewarded by the securing of the nest figured on the opposite page, and three young birds in the pin feather. A careful search was made on the ground and all about for fragments of the egg shells but nothing was found.

The nest, which is believed to be the first one secured, is situated in a vertical crotch and was virtually hidden from view by the leaves which surrounded it. It is composed externally of coarse

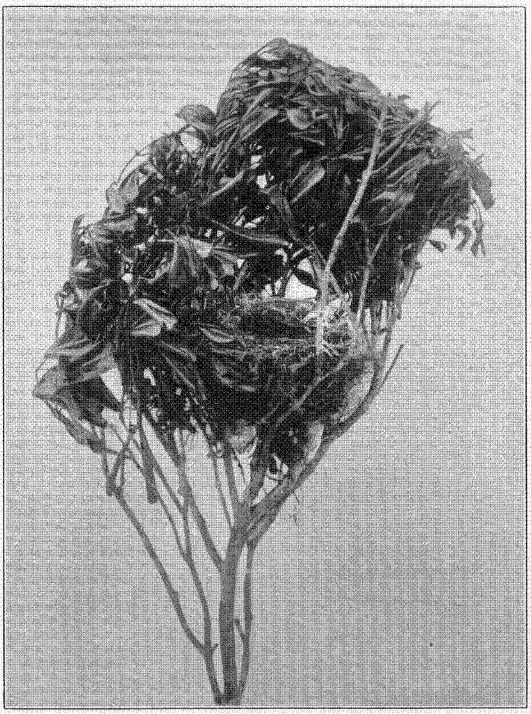

FIG. 7. NEST OF CHLORODREPANIS PARVA (STEJN.).

moss and lichens, into which are loosely placed weed stems, skeletons of leaves, and a few roots. The inside lining is made up almost entirely of stiff black hair-like rootlets. The nest is 3.50 inches deep by 4.00 broad outside; inside it is 2.25 across the bowl by 1.50 deep. In general appearance it more closely resembles nests of *Chlorodrepanis* and *Himatione* than it does the nests of *Oreomyza* in the Museum.

A close study of the material secured has resulted in placing *parva* in the genus *Chlorodrepanis* (Memoirs B. P. B. Mus., Vol. I., pt. 3, p. 46). *Oreomyza bairdi*, which is given by Dr. Stejneger as the type of the genus *Oreomyza*, has the tongue but slightly rolled up on the edges, and the tip is bifurcated; while in *parva* it is perfectly tubular in form, with the brush-like ciliæ at the tip, which is a character well marked in all the members of the *Chlorodrepanis* genus. In adult *parva* the edges of the tongue meet and roll past each other to form the sucking tube. While in the very young, as exhibited by the nestlings just mentioned, the tongue shows no marked lateral rolling, nor does it meet to form a tube. This would seem to indicate most clearly that this form has been evolved from an ancestral type in which this organ was normal, and would remove the form farther from the parental stem than the more typical genus *Oreomyza*.

Oreomyza bairdi Stejn. **Akikihi.**

We secured a good series of this energetic little creeper-like bird. In its search for food it would often come down on the ferns and trunks of trees to within a couple of feet of the ground, but it was never seen to alight on the ground. On other occasions it was seen feeding high up among the ohia branches, but always keeping to the bark and limbs, where its antics remind one of the nut hatches of America. In habit it is totally different from either of the *Chlorodrepanis* of Kauai.

Loxops cæruleirostris (Wils.). **Ou holowai.**

On the ridges two or three miles above Kaholuamano this species is quite plentiful, feeding about the blooming ohia. They are somewhat gregarious—eight to fifteen will sometimes alight in a clump of trees. Their graceful movements and beautiful olive and yellow plumage make them one of the one of the most charming of the Kauai mountain birds. Young birds were secured which would indicate that the breeding season was as early as February.

Hemignathus procerus Cab. **Kauai Akialoa.**

We collected four specimens of this bird and saw a number of others. One young male (Mus. No. 9220) taken April 27 is in a plumage that would make February or March the probable nesting season. The food seems to be largely insects. The eye in the young bird is a dark hazel, the feet gray, and the bill dusky grayish. The above specimen was taken while feeding about the trunks and limbs of an ohia tree much the same as a flicker would do. They use their long bills to feel under bits of bark and in cracks and holes. One was seen to reach under a bit of bark and pull out a big larva which it devoured greedily. Three others were seen near the same place. They are very wary and hard to approach, generally keeping to the higher altitudes, none being seen below 3500 feet. A fine male was taken on April 30 from a flowering ohia tree well on towards the summit of Waialeale.

Psittacirostra psittacea (Gmel.). **Ou.**

A single beautiful male specimen was taken on April 30 at upwards of 4000 feet elevation. Mr. Gay states that the species is far more plentiful in the valleys, where it feeds on the guava often coming down lower than 300 feet elevation after them; and it was his impression that in favorable localities they would come down almost to the sea level if food was more plentiful there.

Phæornis myadestina Stejn. **Kamau.**

On April 18, while sitting in ambush under some trees, two of these birds came and alighted quite near us. They were very quiet, but seeing us their curiosity was aroused, and coming nearer they dropped their wings so that they almost touched the branch they were sitting on, keeping them all the while in a quiver. After satisfying themselves that we were not liable to molest them they flew very near to each other when one seemed to be taking food from the other's bill, or at least to rub his bill through the mouth of the other. These birds were quite similar in color and were billing probably preparatory to mating. The song of this species is remarkably sweet. While the birds are shy, their size together with their song, which is given at all times of day—and on one occasion was heard in the dead of the night—make them not a difficult bird to secure. No young were collected, which taken in connection with the mating performance just detailed would indicate May as their probable nesting time. This species was fairly common, while *Phæornis palmeri* was not met with during our stay.

List of Accessions.

DEPARTMENT OF ORNITHOLOGY AND MAMMOLOGY.

Mammals Purchased.—Mounted.

8780 Zalophus californianus, Less. San Francisco, Cal.
8781 Macropus frænatus, Gould. New South Wales.

Mammals Collected.

8782 Herpestes griseus, Geoff. ♂ Collected by A. Seale.
8968 Cervus philippinus, H. Smith. Skull and antlers. Guam, Marianas. Collected by A. Seale.

Birds Purchased.—Mounted.

9185 Macropteryx mystacea, Müller. Duke of York Ids.
9186 Hirundo neoxena, Gould. New South Wales.
9187 Sauromarptis gaudichaudi, Q. & G. New Guinea.
9188 Melidora macrorhina, Less. New Guinea.
9189 Tanysiptera salvadoriana, Ramesq. New Guinea.
9190 danæ, Sharpe.
9191 microrhyncha, Sharpe. New Guinea.
9192 Alcyone azuræ, Ewing. Tasmania.
9193 Menura superba, Davis. ♂ Victoria, Aust.
9194 Chilonyx ochrocephala, Gmel. New Zealand.
9195 Merula obscura, Gmel. Samoa.
9196 Chibia læmosticta, Sclater. New Britain.
9197 Pitta mackloti, Temm. New Guinea.
9198 Lalage tricolor, Swains. New Guinea.
9199 Eopsaltria australis, White. New South Wales.
9200 Gymnorhina hyperleuca, Gould. Tasmania.
9201 Gymnocorvus senex, Less. New Guinea.
9202 Paradisea raggiana, Sclater. New Guinea.
9203 Manucodia atra, Less. New Guinea.
9204 chalybeata, Penn. New Guinea.
9205 comrii, Sclater. New Guinea.
9206 Mænatus religiosus, Less. Malay Peninsula.
9207 Rhytidoceros subruficollis, Blyth. New Zealand(?).
9208 plicatus, Forster. New Guinea.
9209 Lorius hypœnochrous, Gray. Fiji.
9210 Chalcopsittacus scintillatus, Temm. New Guinea.
9211 Trichoglossus rubritorques, Vig. & Horsf. Queensland.
9212 Nasiterna pusio, Sclater. Solomon Ids.

9213 Cyptorhynchus xanthonotus, Gould. South Australia.
9214 Microglossus aterrimus, Vieill. New Guinea.
9215 Globicera oceanica, Less. Samoa.
9216 Carpophaga rufiventris, Salvad. New Guinea.
9217 Melagoprepia assimilis, Gould. Cape York, Aust.
9218 Reinwardtœnas reinwardti, Heine & Rhno. New Guinea.
9219 Otidiphaps cervicalis, Rams. New Guinea.
9220 Goura albertisii, Salvad. New Guinea.
9221 Didunculus strigirostris, Jard. Samoa.
9222 Megapodius cumingi, Dillwyn. Solomon Ids. (?)
9223 Demiegretta sacra, Gmel. (Sum. plum.) Samoa.
9224 sacra, Gmel. (Wint. plum.) Samoa.
9225 Carphibis spinicollis, Reich. New South Wales.
9226 Himantopus leucocephalus, Gould. Australia.
9227 Porphyrio melanotus, Newt. New Zealand.
9228 Tribonyx mortieri, Dubos. Queensland.
9229 Amaurornis moluccana, Wall. Duke of York Id.
9230 Chenonetta jubata, Brandt. Tasmania.
9231 Nettopus pulchellus, Gould. New Guinea.
9232 Spatula rhyncholus, Gray. New Zealand.
9233 Gabianus pacificus, Bruch. Australia.
9234 Larus dominicanus, Licht. New Zealand.
9235 Phalacrocorax carunculatus, Steph. New Zealand.
9236 Pelicanus conspicillatus, Reich. New South Wales.
9238 Mino dumonti, Less. Duke of York Id.
9239 Phalacrocorax varius, Gmel. New Zealand.
9240 Drepanornis albertisi, Sclater. New Guinea.
9241 Parotia sexpennis, Bodd. New Guinea.
9242 Lophorhina superba, Vieill. New Guinea.
9243 Paradigalla carunculata, Eyd. & Souleyet. New Guinea.
9244 Xipholena pompadora, Gould. New Guinea.
9255 Megaloprepia magnifica, Temm. New Guinea.

Birdskins Given.

9285 Vestiaria coccinea, Forster. ♀ Oahu, H. I. Given by Dr. Huddy, Honolulu.
9305 Larus glaucus, Brunn. Kauai, H. I. Given by Francis Gay Esq., Waimea, Kauai.
9306 Puffinus newellii, Henshaw. Kauai, H. I. Given by Francis Gay Esq., Waimea, Kauai.

Birdskins Collected.

By A. Seale, on Oahu, H. I.

9149–55 Haliplana fuliginosa, Gmel. 6♂, 1♀.
9156–58 Anous stolidus, Linn. 3♂.
9159 Totanus incanus (Gmel.). ♀
9160 Phasianus torquatus, Gmel. ♀
9161 Charadrius dominicus fulvus (Gmelin). ♀

9162–3 Totanus incanus (Gmelin). 1 ♂, 1 ♀.
9164–5 Microanous hawaiiensis, Roths. 2 ♂.
9166–7 Dafila acuta, Linn. 1 ♂, 1 ♀.
9168 Anas wyvillianus, Sclater. ♂
9169 Porphyrio melanotus, Newt. ♂
9170 Nycticorax nycticorax nævius (Bodd.). ♂
9171 Arenaria interpres (Linn.). ♀
9172–3 Charadrius dominicus fulvus (Gmel.). ♂
9174 Arenaria interpres (Linn.). ♀
9175 Nycticorax nycticorax nævius (Bodd.).
9176 Acridotheres tristis, Linn.
9180 Asio accipitrinus, Pall. ♀
9182–4 Turtur chinensis, Scop. 2 ♀, 1 ♂.
9246–70 Chasiempis gayi, Wilson. 16 ♂, 9 ♀.
9271 Turtur chinensis, Scop. ♂
9272 Asio accipitrinus, Pall. ♂
9273 Acridotheres tristis, Linn. ♂
9274–84 Himatione sanguinea, Gmel. 6 ♂, 5 ♀.
9286 Himatione sanguinea, Gmel. ♂
9287–89 Chlorodrepanis chloris, Cab. 2 ♂, 1 ♀.

By Wm. A. Bryan and A. Seale, on Kauai, H. I.

9307–25 Himatione sanguinea, Gmel. 12 ♂, 7 ♀.
9326–51 Vestiaria coccinea, Forster. 17 ♂, 8 ♀, 1 juv.
9352–61 Loxops cæruleirostris, Wilson. 8 ♂, 2 ♀.
9362–82 Chlorodrepanis parva, Stejn. 10 ♂, 11 ♀.
9383–92 Phæornis myiadestina, Stejn. 5 ♂, 4 ♀, 1 ?.
9393–96 Chlorodrepanis stejnegeri, Wilson. 3 ♂, 1 ♀.
9397 Charadrius dominicus fulvus, Gmel.
9398–9403 Oreomyza bairdi, Stejn. 2 ♂, 4 ♀.
9404–17 Chasiempis sclateri, Ridgway. 7 ♂, 6 ♀, 1 ?
9418–22 Hemignathus obscurus, Gmel. 3 ♂, 2 ♀.
9423 Psittirostra psittacea, Gmel. ♂
9424–25 Anas wyvilliana, Sclater. ♂
9426–30 Himanotopus knudseni, Stejn. 2 ♂, 3 ♀.
9431 Charadrius dominicus fulvus, Gmel. ♀
9432 Fulica alai, Peale, ♂
9433 Nycticorax nycticorax nævius, Bodd. ♀
9434 Anas wyvilliana, Sclater. ♂
9435 Loxops cæruleirostris, Wilson. ♂
9436 Chlorodrepanis parva, Stejn. ♂
9437 Oreomyza bairdi, Stejn. ♂
9438 Chasiempis sclateri, Ridg. ♂
9439 Himatione sanguinea, Gmel. ♀
9440 Vestiaria coccinea, Forster. ♀
9441–44 Gallus gallus, Linn. ♂, ♀, and juv.

By A. Seale, on Guam, Marianas.

9449–69 Myzomela rubrata, Less. 15 ♂, 2 ♀, 4 juv.
9470–75 Rhipidura uraniæ, Oust. 3 ♂, 3 ♀.

9476–86 Myiagra freycineti, Oust. 3♂, 6♀, 1 juv., 1 ?.
9487 Corvus kubaryi, Rchw. ♀
9488–98 Ptilinopus roseicapillus, Less. 8♂, 2♀, 1 juv.
9499–9501 Turtur dussumieri, Temm. 1♂, 2♀.
9502–15 Phlegœnas xanthonura, Temm. 8♂, 6♀.
9516 Sula piscatrix, Linn. ♂
9517–23 Charadrius fulvus, Gmel. ♂
9524–5 Heteractitis incanus, Gmel. ♂
9526 Charadrius mongolus, Pall. ♀
9527–8 Excalfactoria sinensis, Gmel. 1♂, 1♀.
9529–32 Collocalia fuciphaga, Thunb. 2♂, 2♀.
9533–35 Anas oustaleti, Salvad. 1♂, 2♀.
9536–40 Hypotænidia oustini, Roths. 1♂, 3♀, 1 juv.
9541–44 Acrocephalus luscinia, Quoy & Gaim. 3♂, 1♀.
9545–50 Halcyon cinnamonea, Swains. 3♂, 3♀.
9551 Poliolimnas cinereus, Vieill. ♀
9552–65 Aplonis kittlitzi, F. & Hartl. 4♂, 6♀, 4 juv.
9566–77 Zosterops conspicillata, Kittl. 1♂, 9♀, 2 juv.
9578–84 Gygis alba Kittlitzi, Hart. 5♂, 1♀, 1 juv.
9585–88 Demiegretta sacra, Gmel. 1♂, 3♀.
9589–93 Anous stolidus, Linn. 3♂, 2♀.
9594–99 Gallinula chloropus, Linn. 2♂, 4♀.
9600–02 Ardetta sinensis, Gmel. 2♂, 1♀.
9603 sinensis bryani, Seale. (Type.)
9604–07 sinensis bryani, Seale. 1♂, 3♀.
9608 Fregata aquila, Linn. ♂ (Given by Lieut. W. E. Safford.)

By A. Seale, in Monterey, Cal.

9609 Archimophorus occidentalis, Lawr. ♂
9610 Gavia pacificus, Lawr. ♂
9611–12 Colymbus nigricollis californicus, Heerm. 1♂, 1♀.
9613 Stercorarius pomarinus, Temm. ♀
9614 longicaudus, Vieill. ♀
9615 Sterna maxima, Bodd. ♂
9616–20 elegans, Gamb. 4♂, 1♀.
9621–24 Larus philadelphia, Ord. 2♂. 2♀.
9625 heermanii, Cass. ♂
9626 brachyrhynchus, Rich. ♀
9627–29 occidentalis, And. 1♂, 2♀.
9630–34 Ceratorhyncha monocerata, Pall. 1♂, 4♀.
9635–36 Fulmarus glacialis glupischa, Stejn. 1♂, 1♀.
9637 Puffinus opisthomelas, Cones. ♀
9638–9 griseus, Gmel. 1♂, 1♀.
9640 Cepphus columba, Pall. ♂
9641 Brachyramphus marmoratus, Gmel. ♀
9642 Uria triole, Linn. ♂
9643 Munia nisoria, Temm. ♂ Oahu, H. I.

DEPARTMENT OF ENTOMOLOGY.

Received 27 boxes insects, divided as below, being part of the collection made in the Hawaiian Islands by Mr. R. C. L. Perkins: 7 boxes containing Lepidoptera ; 9 boxes containing Neuroptera ; 3 boxes containing Coleoptera ; 3 boxes containing Hymenoptera ; 5 boxes containing Orthoptera.

Collection of American Butterflies from Mrs. Sarah H. Mitchell, Kansas City, Mo.

DEPARTMENT OF CONCHOLOGY.

Part of the collection made in the Hawaiian Islands by Mr. R. C. L. Perkins, consisting of the land shells of the Achatinellidæ, Succineidæ and Tornatellidæ.

Collection of land and marine mollusca made in Guam by Mr. Seale. Not yet classified.

DEPARTMENTS OF BOTANY AND GEOLOGY.

Collection of botanical specimens made on Kauai by Messrs. Bryan and Seale, and a collection made by Mr. Seale in Guam. These will be classified later.

8575–8577 Argyroxiphium sandwicense, De Cand. Haleakala, Maui. Three specimens given by Miss Carrie Castle.

DEPARTMENT OF GEOLOGY.

8,566 Zeolite, from Nuuanu Valley, Oahu, H. I. Given by Mr. F. Rowald.

10,010 Collection, 25 specimens from North America and the West Indies. Given by Mrs. S. M. Damon.

DEPARTMENT OF HERPETOLOGY.

7,960 Cast of Crotalus adamanteus. Arizona.

7,961 Cast of Crotalus adamanteus (juv.). Arizona. Given by Mr. John W. Thompson.

Given by Prof. H. W. Henshaw, Hilo, H. I.

10,042 Emoia cyanura, Lesson. Keaukaha, Hawaii.

10,043–4 Ablepharus boutonii pœcilopleurus, Wiegmann. Keaukaha, Hawaii.

10,045 Ablepharus boutonii pœcilopleurus, Wiegmann. Naolelo, Kau, Hawaii.

10,046 Leiolopisma noctua, Lesson. Coconut Island, Hawaii.

10,047–8 Peropus mutilatus, Wiegmann. Kau, Hawaii.

10,049 Hemidactylus garnotii, Dumeril & Bibron. Hilo, Hawaii.

10,050–4 Lepidodactylus lugubris, Dum. & Bib. Hilo, Hawaii.

10,055 Lepidodactylus lugubris, Dum. & Bib. Kau, Hawaii.

10,056 Lepidodactylus lugubris, Dum. & Bib. Keaukaha, Hawaii.

DEPARTMENT OF ICHTHYOLOGY.

Collection of fishes made by Mr. A. Seale on Guam. Named and numbered on previous pages.

SPONGES, CORALS, ASTEROIDS AND MISCELLANEOUS.

8,996–7 Euplectella aspergillum, Owen. Zamboanga. Philippine Islands. Given by Hon. Dean C. Worcester, Philippine Commission.
10,011 Hyalonema sieboldii, Gray. Japan.
8,935 Asterias sp. Koloa, Kauai. Given by A. F. Judd Esq.
8,936 Ophidiaster sp. Koloa, Kauai. Given by Miss Georgiana Williams.
10,012 Pocillopora granis, Dana. Society Islands.
10,016 Renilla amethystina. California.

ETHNOLOGY AND ANTHROPOLOGY.

7,508 Pohaku hana ikaika. Kauai. Given by W. H. Rice, Jr.
7,509 Skull of young Hawaiian girl. Kauai. Given by J. K. Farley Esq.
7,551 Canoe model. Marshall Ids. Given by A. F. Judd Esq.
7,625 Stone dish, oval, knob on each end. Hawaiian Ids.
7,628 Sling stone. Oahu.
7,868–70 Umeke poi, kou (*Cordia subcordata*). Wooden bowls. Hawaiian Ids.
7,952–3 Poi boards of koa. Hawaiian Ids.
7,954–5 Poi pounders, ring form. Kauai, H. I.
7,956 Disk, thick, wooden. Hawaiian Ids.
7,957 Polishing stone. Hawaiian Ids.
7,958 Stone lamp. Hawaiian Ids.
7,959 Stone mortar or lamp. Hawaiian Ids.
8,090 Basket of fern stems; modern Hawaiian manufacture.
8,540 Strips of plaited Pandanus and fern stem prepared for hat making. Kauai. Coll. A. Seale.
8,541 Fern stem. Kauai. Coll. A. Seale.
8,542 Peelings from No. 8541 used in No. 8540. Coll. A. Seale.
8,543 Leaves of loulu (Pritchardia sp.) palm. Coll. A. Seale.
8,544 Strips of loulu palm prepared for weaving. Coll. A. Seale.
8,569 Body of very young baby (Hawaiian) dried and wrapped in kapa. Oahu.
8,578 Hat of bambu, Samoan. Given by Mrs. Falke.
8,636–64 Umeke poi (29) of kou (*Cordia subcordata*) and milo (*Thespesia populnea*), ranging in sizes from 7×2½ inches to 19×7½ inches. Purchased in Honolulu.
8,665 Ipu kai, Fish dish, kou. Purchased in Honolulu.
8,666–7 Two wooden boxes containing outfits for members of Hale Naua, Honolulu. Bequeathed by deceased members.

7,974 Filipino skull. Given by Col. Woodruff.

Given by the Trustees of Oahu College, Honolulu.

8,671 Helmet of ieie (*Freycinetia arnottii*). Hawaiian Ids.
8,672–7 Kapa beaters. Hawaiian Ids.
8,678 Ulu maika. Hawaiian Ids.
8,679 Adz head, unfinished. Hawaiian Ids.
8,680 Adz head. Hawaiian Ids.
8,681 Drum, sharkskin head. Marquesas Ids.
8,682–5 Wooden legs, showing tatu pattern. Marquesas Ids.
8,686 Carved wooden dish. Marquesas Ids.
8,687 Neck ornament of human hair bound with sennit. Marquesas Ids.
8,688–9 Anklets of human hair. Marquesas Ids.
8,690 Coronet, band of braided sennit supporting pearl shell. Marquesas Ids.
8,691 Pair bone ornaments. Marquesas Ids.
8,642–3 Staves of wood ornamented at one end with human hair. Marquesas Ids.
8,694 Club. Marquesas Ids.
8,695 Nose flute. (?)
8,696 Club, pineapple type. Fiji.
8,697 Club. Tonga.
8,698–9 Club-shaped sword, coconut wood. Gilbert Ids.
8,700–2 Spears edged with shark's teeth. Gilbert Ids.
8,703 String of human teeth. Gilbert Ids.
8,704 Large round ball of sennit, 3 feet 3 inches in circumference. Marshall Islands.
8,785 Cinet covered with fine matting. Marshall Ids.
8,786 Shell adz. Marshall Ids.
8,787 Canoe bailer, breadfruit wood. Caroline Ids.
8,788 Canoe bailer (model). Ruk, Caroline Ids.
8,789 Tol, male dress of banana fibre. Caroline Ids.
8,790 Dance paddle. Mortlock Ids.
8,791 Walrus head (*Trichecus obesus*). Alaska.
8,819 Bracelet of bear tusks. Hawaiian Ids.
8,820 Kupee niho ilio, in fragments. Hawaiian Ids.
8,821 Bundle of kapa markers (10). Hawaiian Ids.
8,822 Kapa ruler. Hawaiian Ids.
8,823–4 Baskets of unknown locality.

From other sources.

8,811 Stone idol. Kailua, Hawaii.
8,812–14 Kapa. Hawaiian Ids.
8,815 Poi pounder, unfinished. Oahu. Given by Edw. Aikua.
8,816–17 Kapa. Hawaiian Ids.
8,818 Notification of the cession of the Hawaiian Islands to Great Britain in 1843; marked on copper. Given by Prof. F. A. Hosmer.

8,931 Stone adze head. Hawaiian Ids.
8,932–3 Samoan paddles. Given by Lieut. W. E. Safford.
8,934 Samoan club. Given by Lieut. W. E. Safford.

Collected by Mr. A. Seale, in Guam, Marianas.

8,937 Bambu water carrier. Agaña.
8,938–41 Mats, Pandanus. "
8,942 Basket, Pandanus. "
8,943 Sack, Pandanus. "
8,944 Rope of Hibiscus fibre. "
8,945 Basket, Pandanus. "
8,946 Bag, Pandanus. "
8,947 Basket, Pandanus. "
8,948–9 Pandanus leaves, dried. "
8,950–1 Hats of Pandanus. "
8,952 Bambu fire sticks. "
8,953 Fillet of grass and Pandanus. From the Caroline Islanders' settlement at Guam.
8,954–6 Dresses of Hibiscus. Caroline Islanders' settlement at Guam.
8,957 Dress of Hibiscus. Ruk, Caroline Ids. Given by Lieut. W. E. Safford.
8,958–59 Hats of Pandanus. Caroline Islanders' settlement at Guam.
8,960 Necklace of flower stamens, plaited. Caroline Islanders' settlement at Guam.
8,961 Iron ground cultivator. Agaña.
8,962–3 Iron lance heads. "
8,964 Iron fish spear. "
8,965 Machete and sheath. Given by Lieut. W. E. Safford. Agaña.
8,966 Sling stone. Given by Padre Paloma. Agaña.
8,967 Sling stone. Agaña.
8,998 Broom, made of midribs of coconut leaves. Agaña.
8,999–9,000 Brooms, made of grass. Luçon, Philippine Ids.

Received from the late C. M. Hyde, D.D.

8,969 Spear. Samoa.
8,970 Fly-flap. Samoa.
8,971 Drill. Tapituea, Gilbert Ids.
8,972 Club made from a whale rib. Gilbert Ids.
8,973 Club made from coconut wood. Maiana, Gilbert Ids.
8,974 Adze. Maiana, Gilbert Ids.
8,975 Adze.
8,976 Ladle of coconut. Gilbert Ids.
8,977 Implement of unknown use. Micronesia.
8,978 Dance wand, small. Marshall Ids.
8,979 Dance paddle. Ponape, Caroline Ids.
8,980–1 Dance wands. Ruk, Caroline Ids.

8,982 Poi pounder of coral rock. Caroline Ids.
8,983 Canoe model. Caroline Ids.
8,984 Club. Samoa.
8,985 Pillow, bambu. Samoa.
8,986–90 Sandals. Hawaiian Ids.
8,991 Basket for fish or shrimps. Hawaiian Ids.
8,992 Coconut cup. (?)
8,993–4 Strings of Conus disks. Gilbert Ids.
10,033 Adz head, stone, small. Hawaiian Ids.
10,034 Fragment of the stalagmite used in Bonabe, Gilbert Ids., to make fish hooks for bonita.

Silverware.—Given by the Hon. C. R. Bishop.

10,001 Tea service, at one time property of Kanaina.
10,002 Forks (8), at one time property of Kekuanaoa.
10,003 Sugar tongs, at one time property of Kekuanaoa.
10,004 Dessert spoon, at one time property of Paki.
10,005 Soup ladle, at one time property of Kuakini.
10,006 Tea spoons (7), at one time property of Kuakini.
10,007 Tea spoons (10), at one time property of Keelikolani.
10,008 Forks, small (12), at one time property of Kekauluohi.
10,009 Sugar tongs, at one time property of Kuakini.

10,013–14 Clubs from New Guinea.
10,015 Club. New Britain.

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[Those marked with an asterisk were obtained by exchange.]

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No. 3222. Vostochni Rookery, St. Paul Island, Alaska.

No. 3223. Lagoon Rookery, St. Paul Island, Alaska.

No. 3224. St. George Island, Pribilof Group, Alaska.

No. 3225. Zapadni Rookery, St. George Island, Alaska.

No. 3226. North Rookery, St. George Island, Alaska.

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No. 3228. East Rookery, St. George Island, Alaska.

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No. 3232. Chart of part of the Bahama Islands, showing the tracks ascribed to Columbus on his discovery of the New World.

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